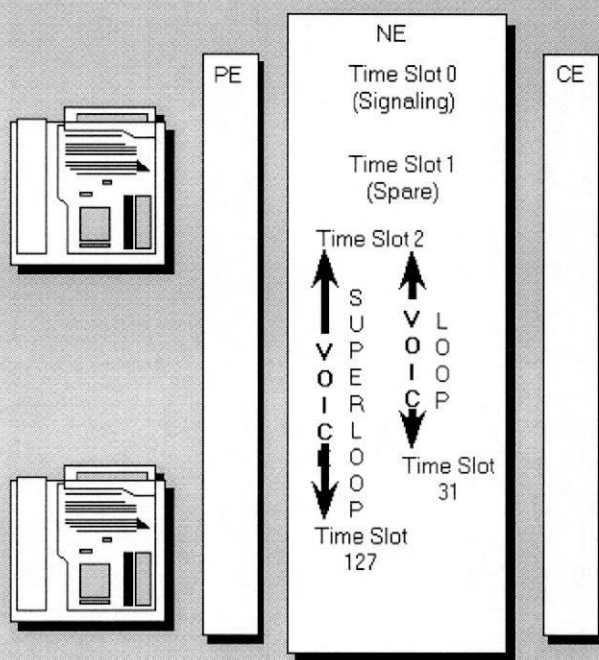
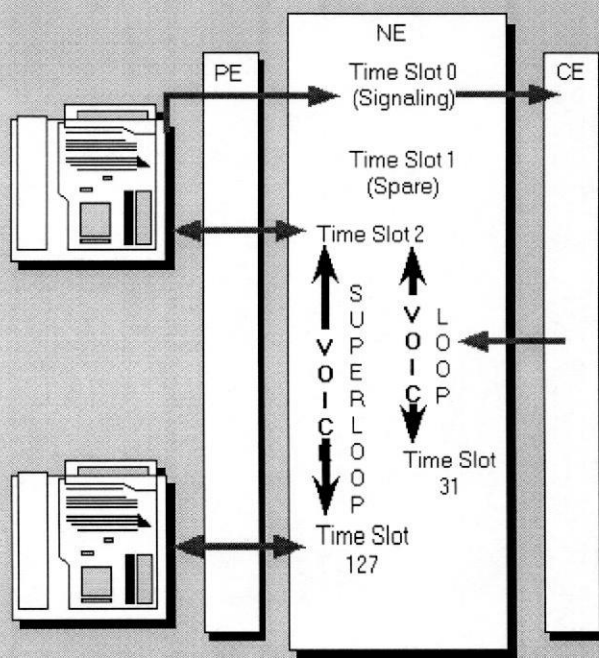


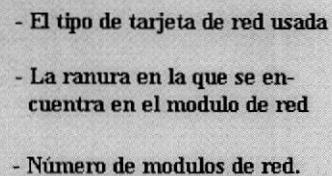
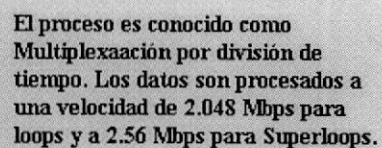


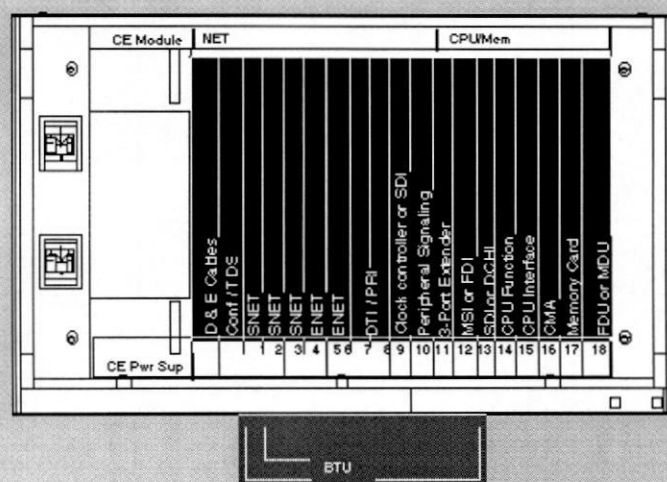
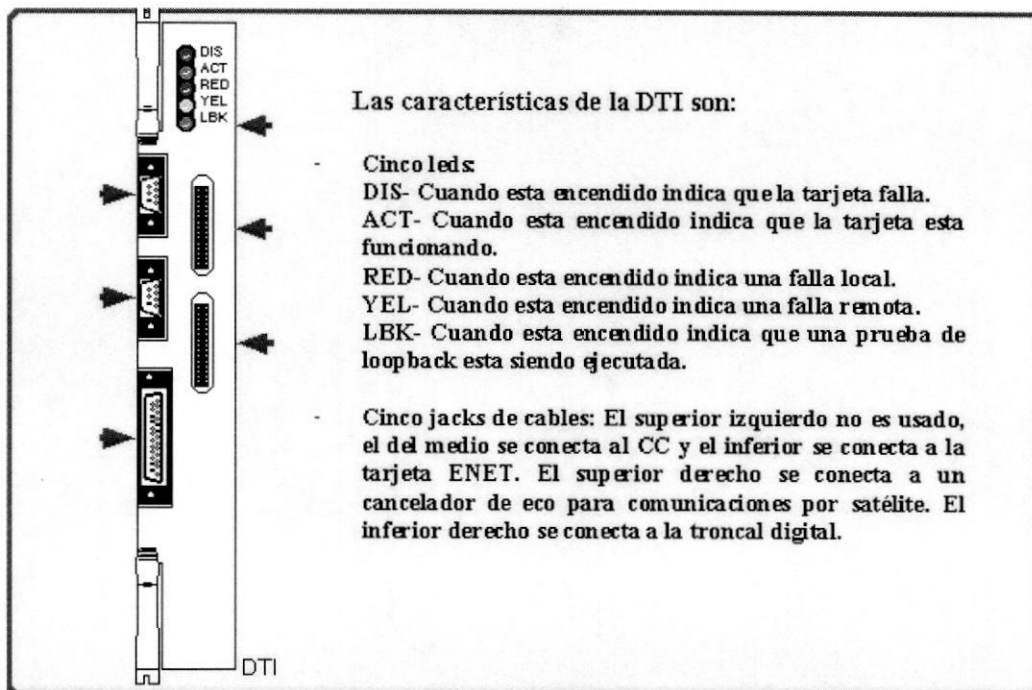
Cada loop/superloop contiene 32/128 ranuras de tiempo las cuales son usadas para unir las estaciones de origen y de término.



Cuando una estación marca un número, la señal va al CPU a través de la ranura 0.

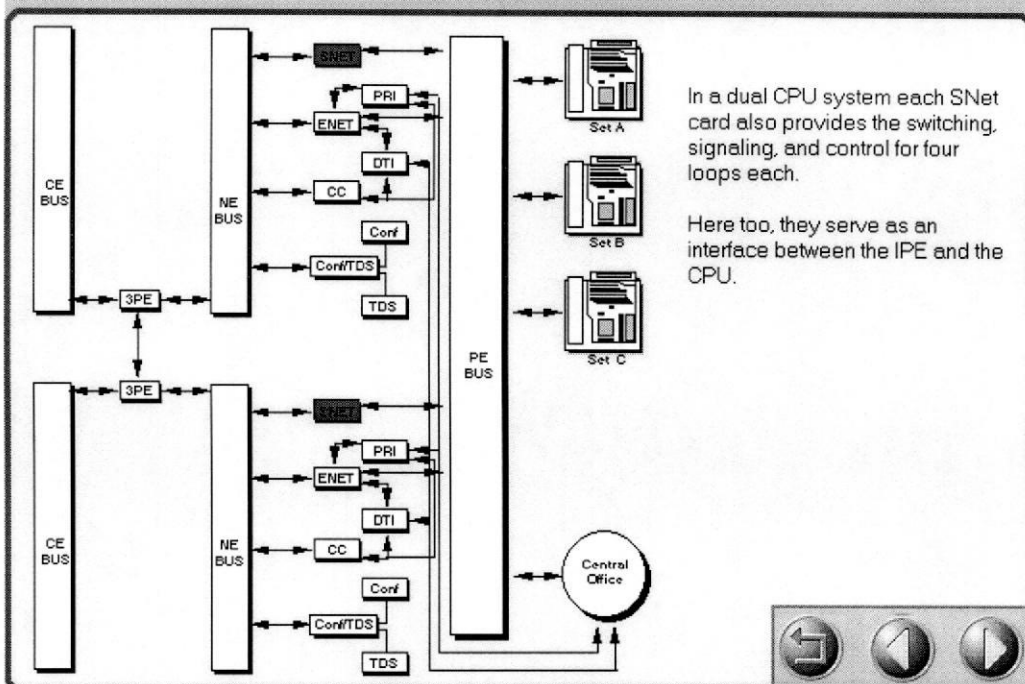
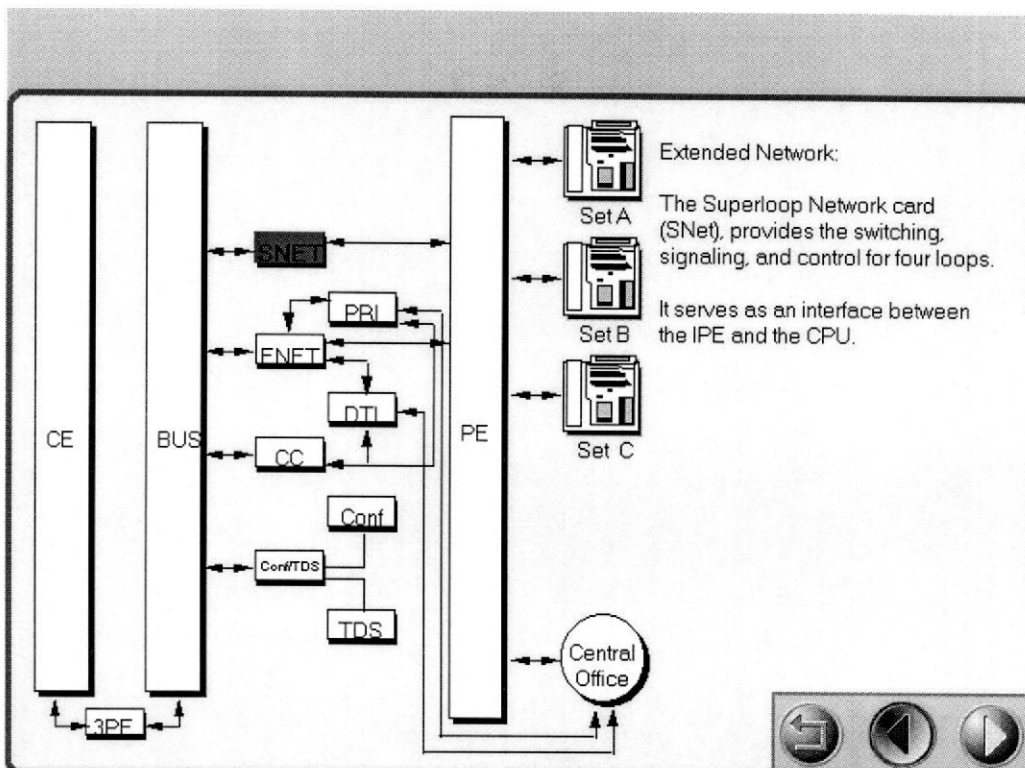
Entonces el CPU determina cuales ranuras estan disponibles para conectar la llamada. Dos diferentes ranuras son requeridas para completar la llamada.

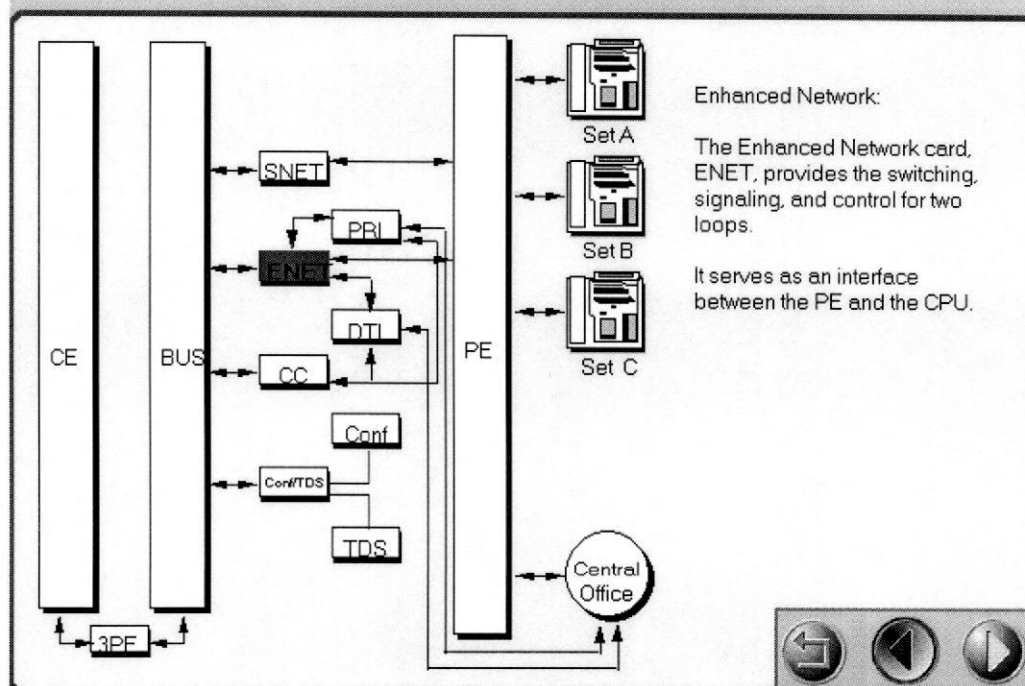
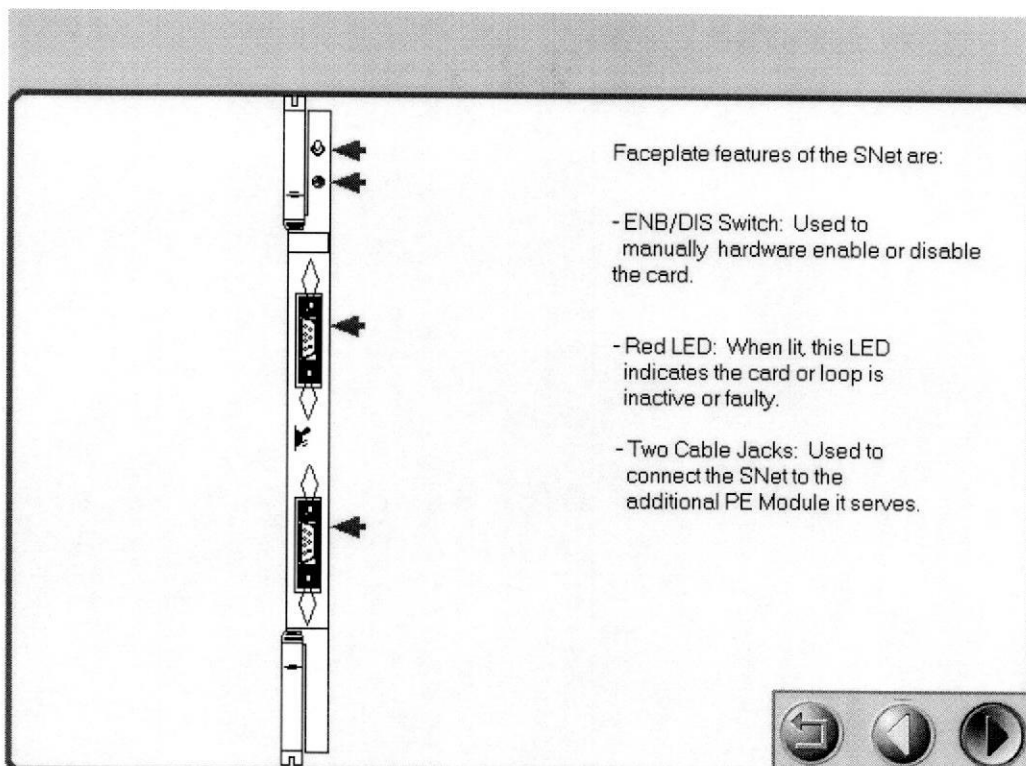


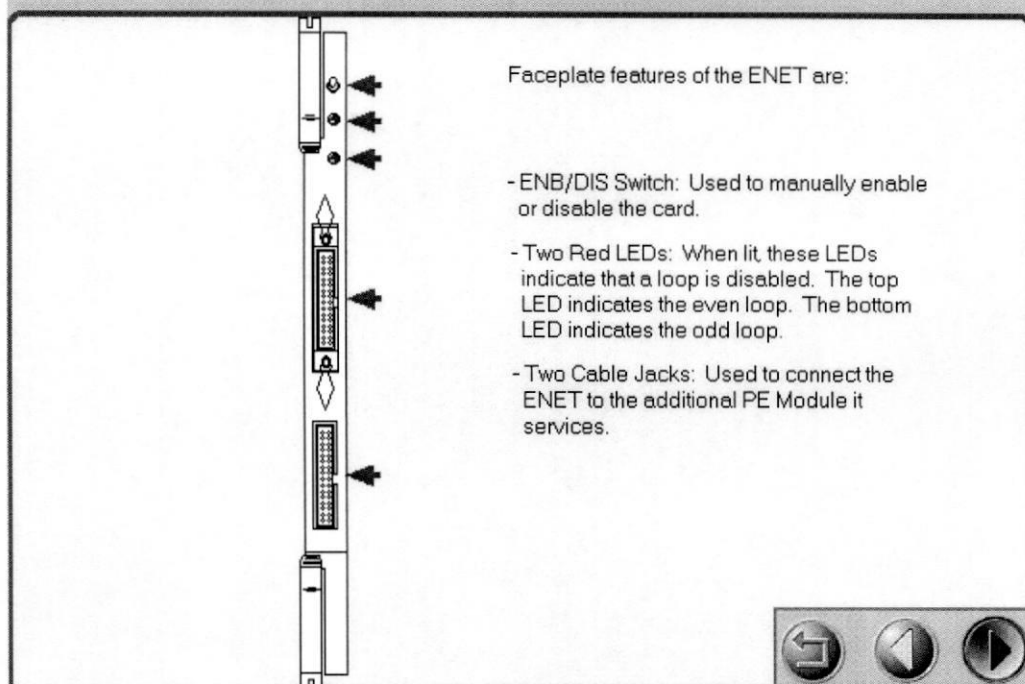
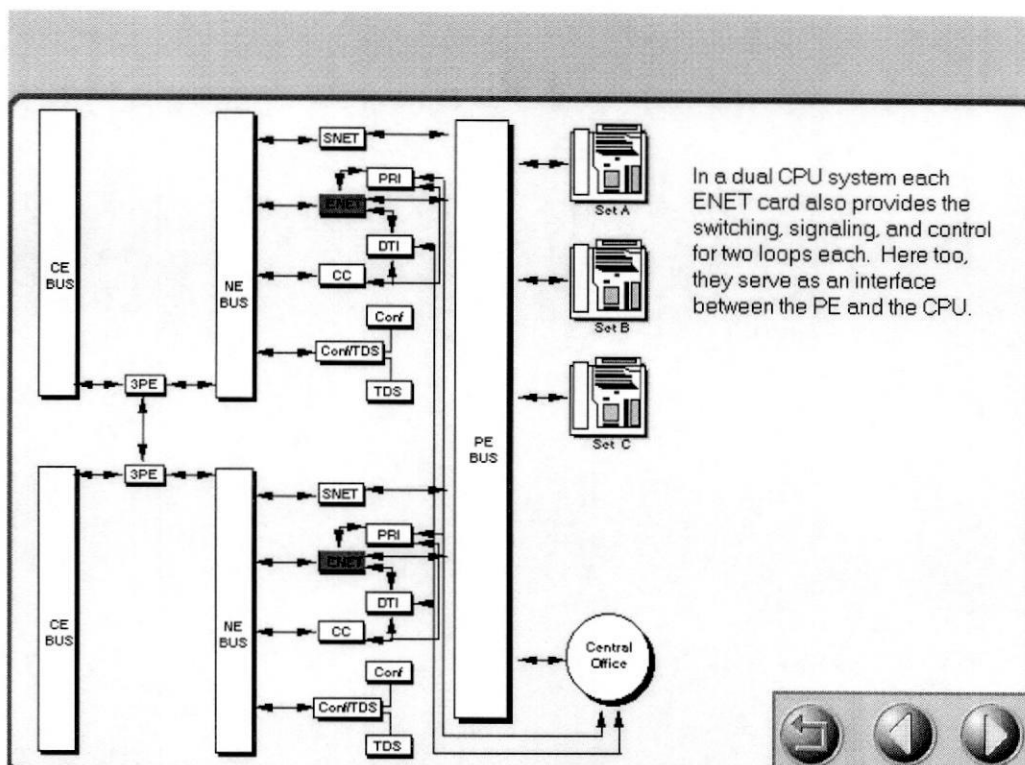


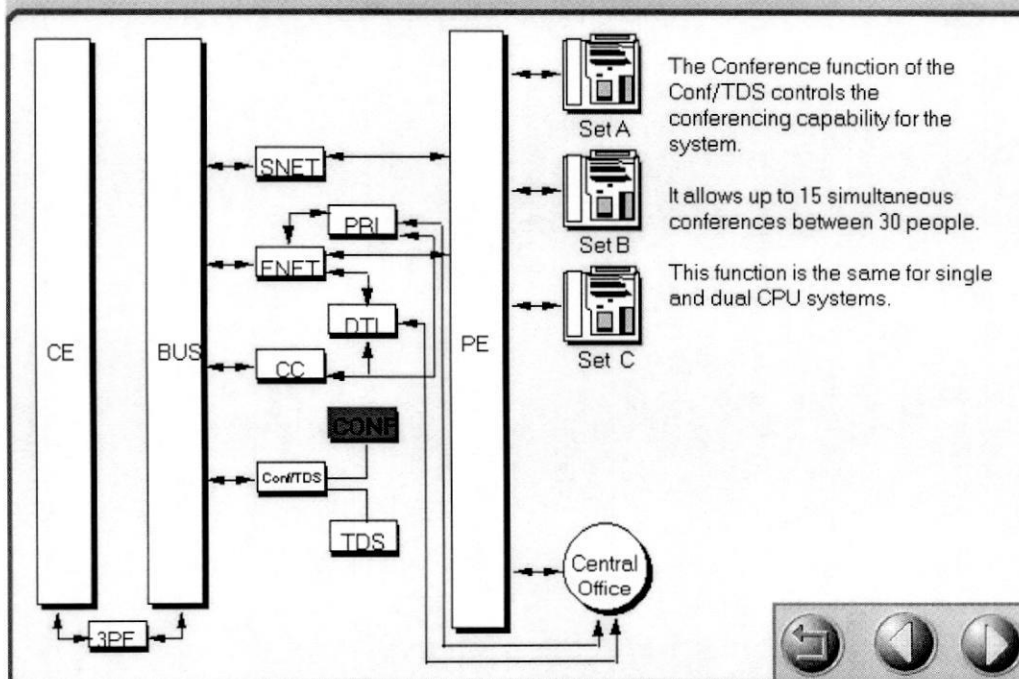
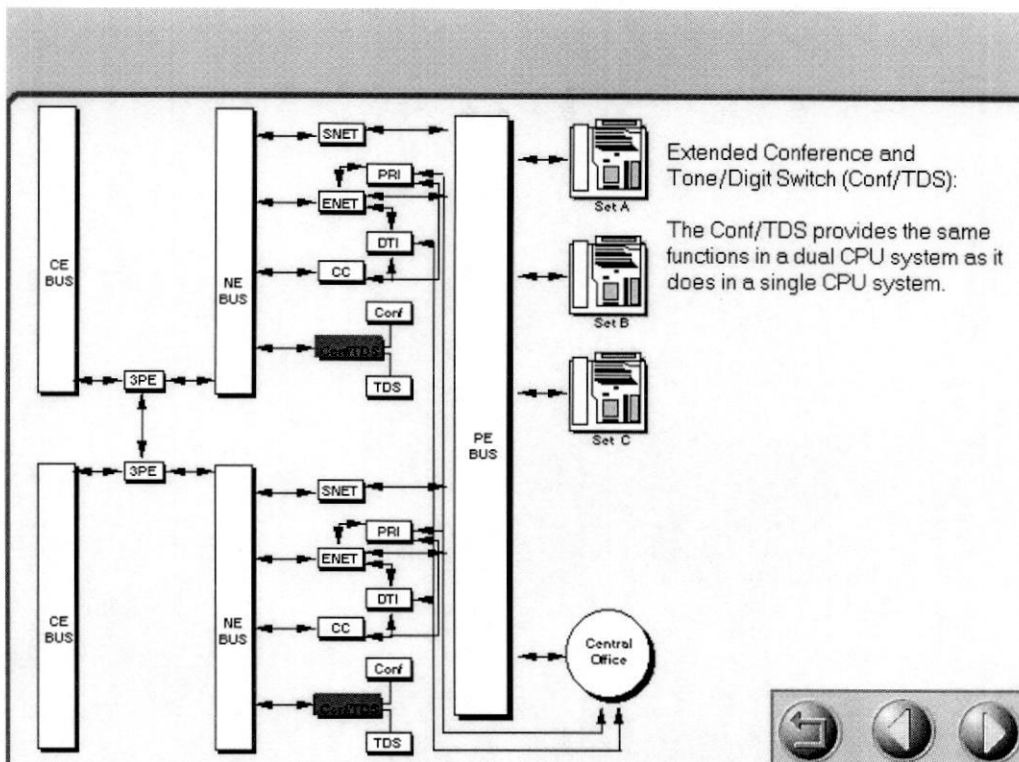
Módulo CPU/Network (CNE):

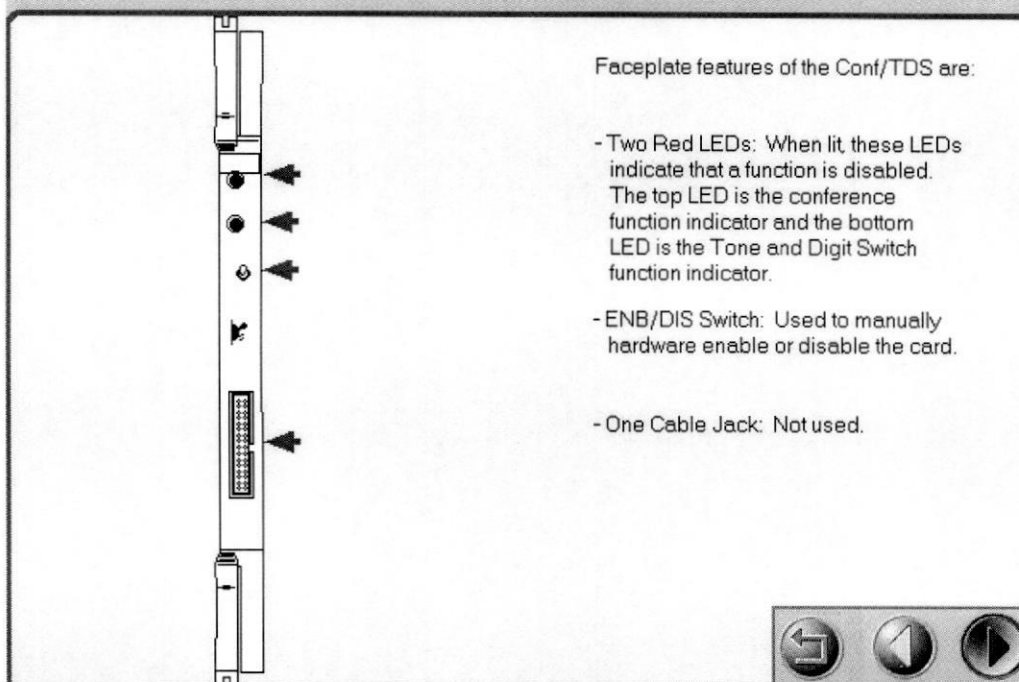
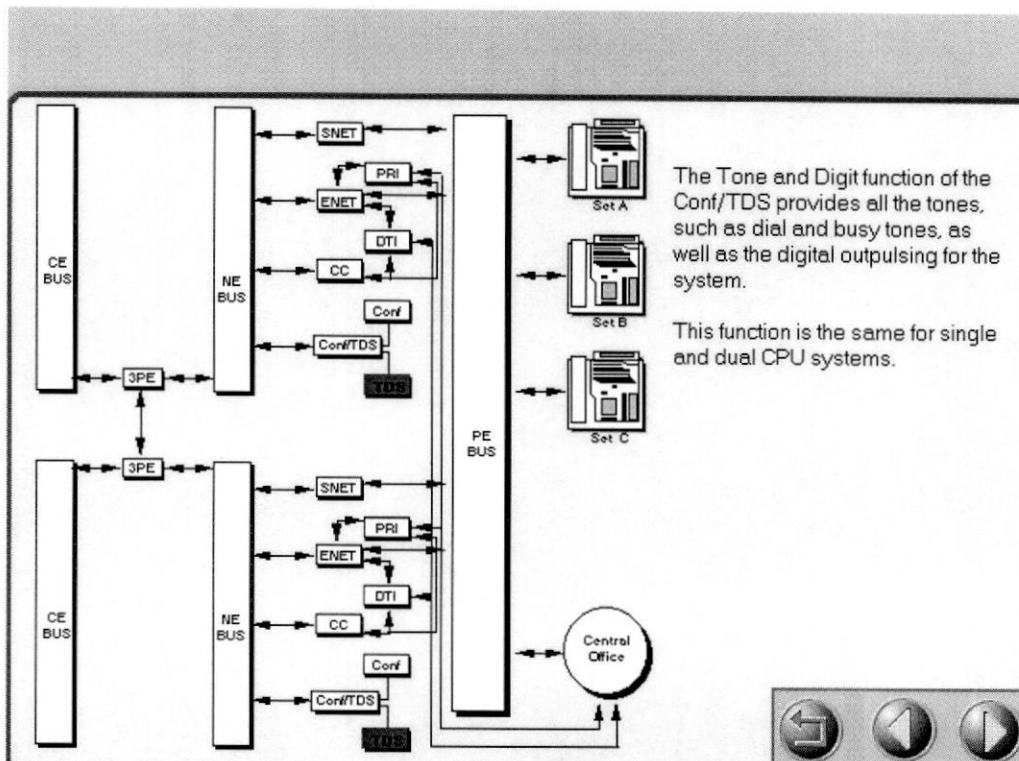
El módulo CNE provee las funciones de conmutación de red y control del CPU en las opciones 51 y 61. Los primeros 11 slots del módulo CNE son usados para alojar equipo de red.

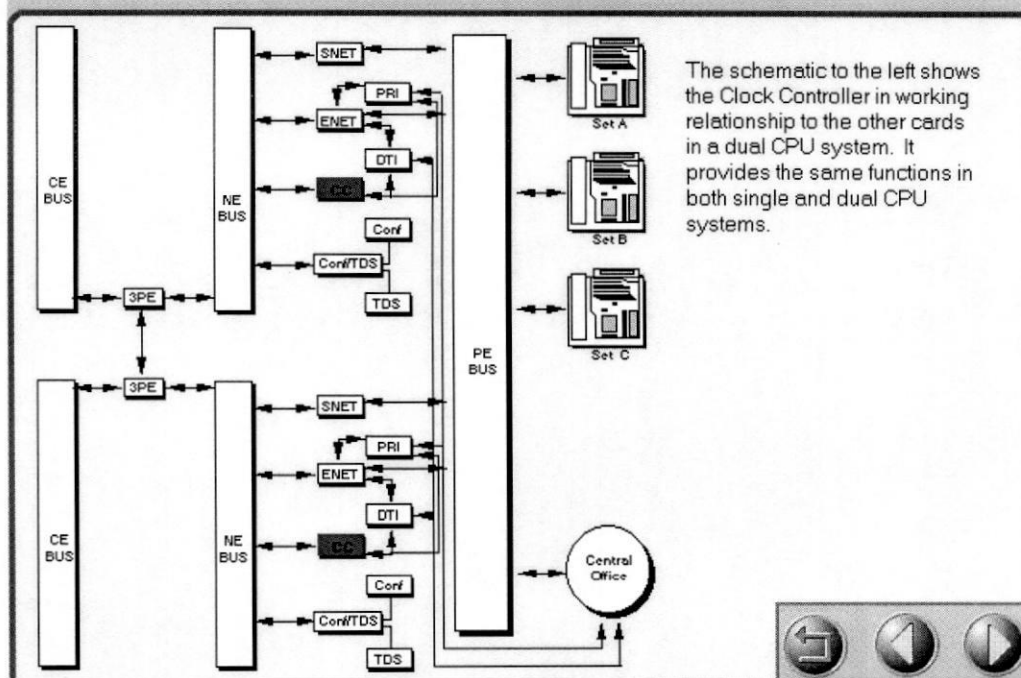
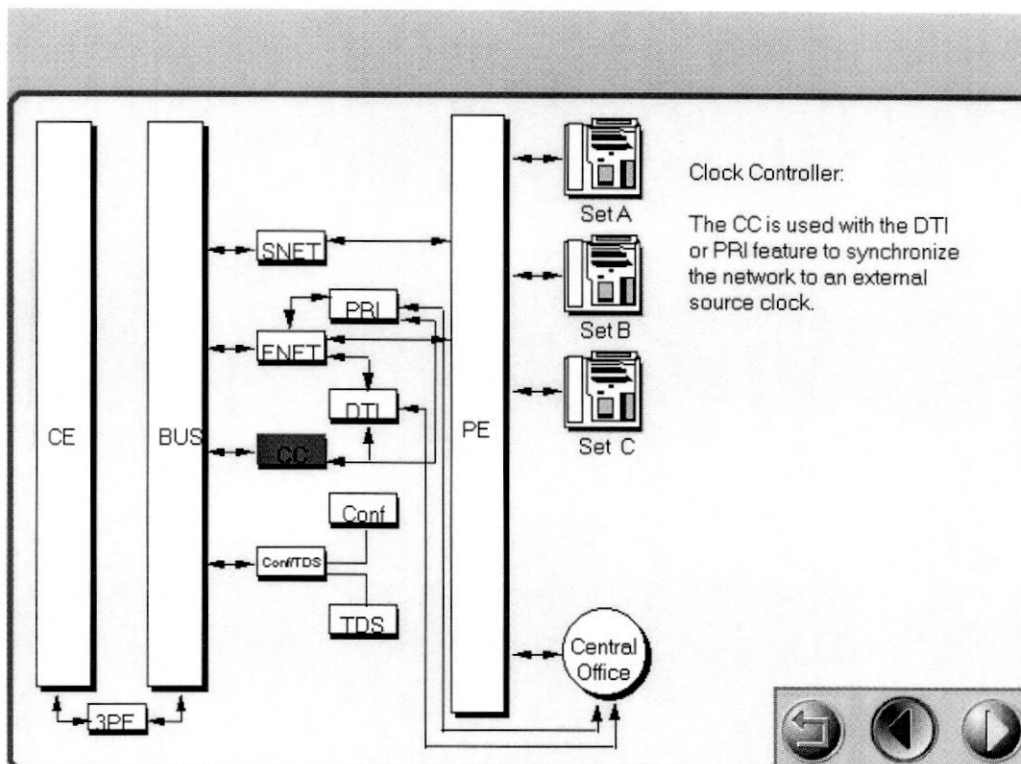








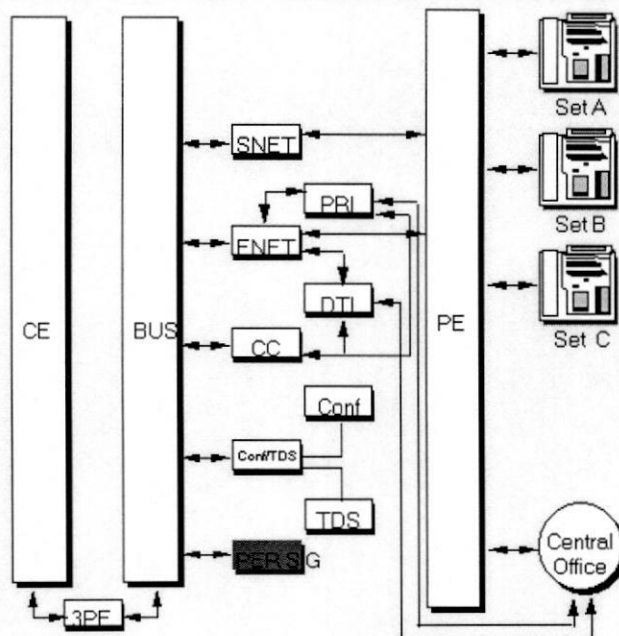






Faceplate features of the CC are:

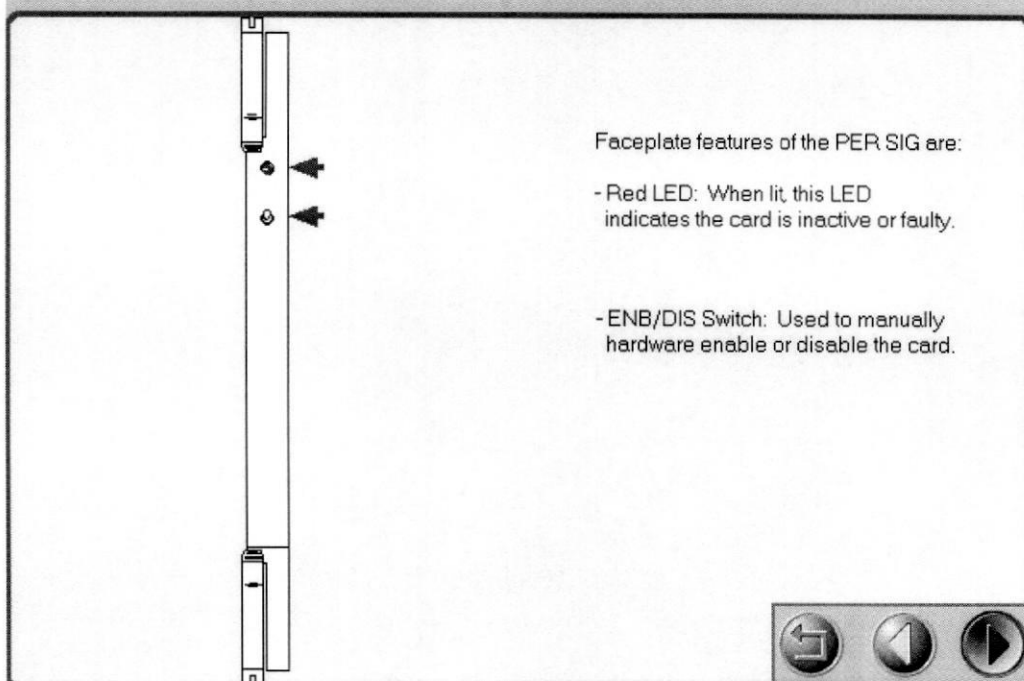
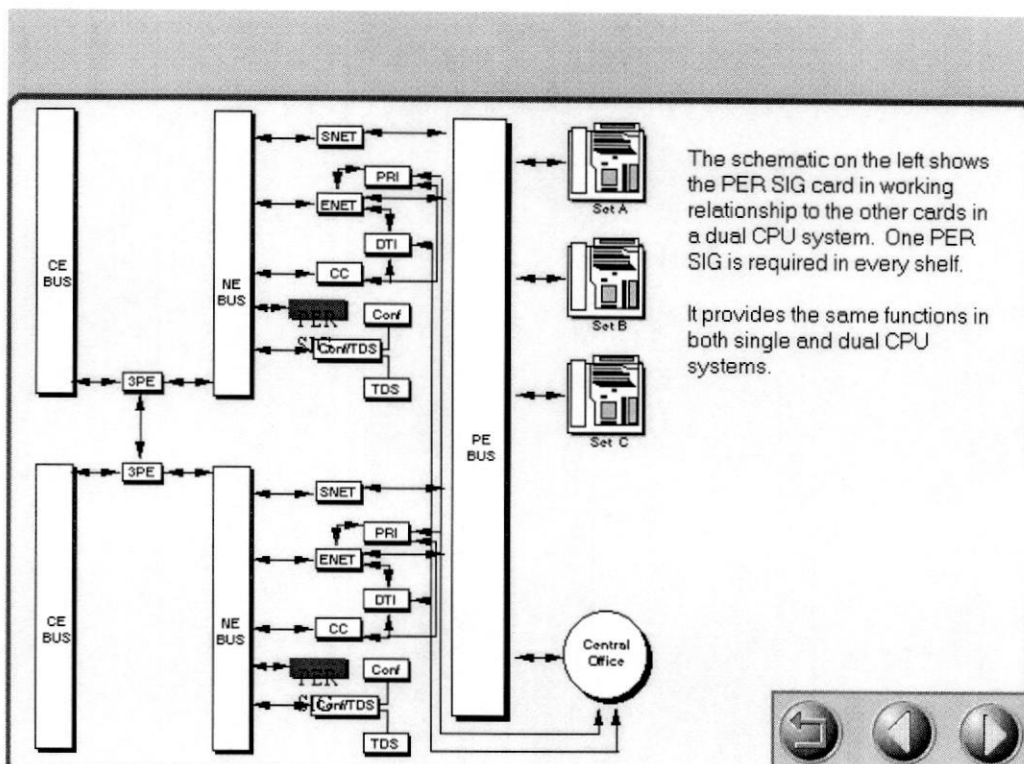
- Red LED: When lit this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Three Cable Connectors: The top two jacks are used to connect to primary and secondary reference sources (secondary may not be required) which are DTI/PRI cards. The Bottom jack is used to connect the two Clock Controllers together in dual CPU systems.

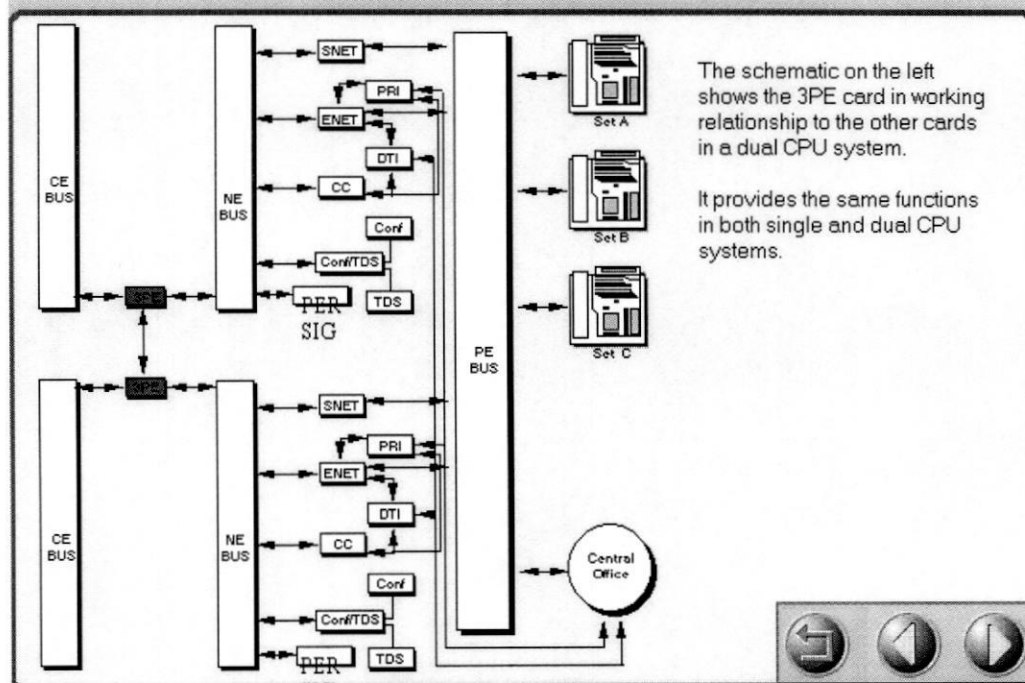
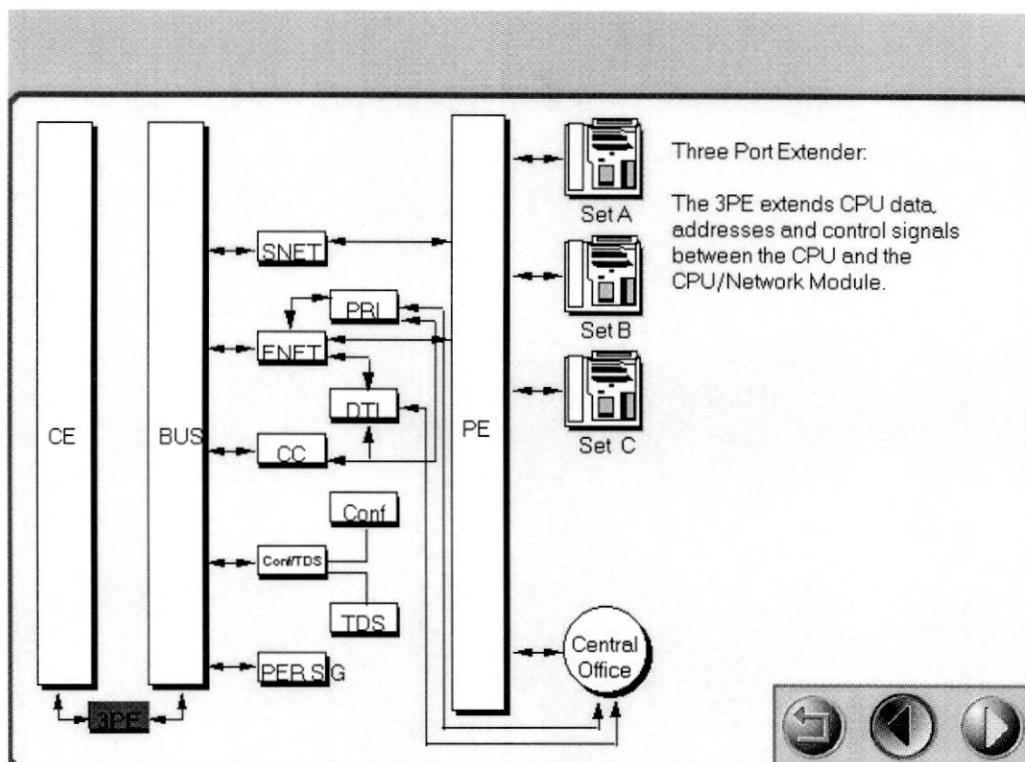


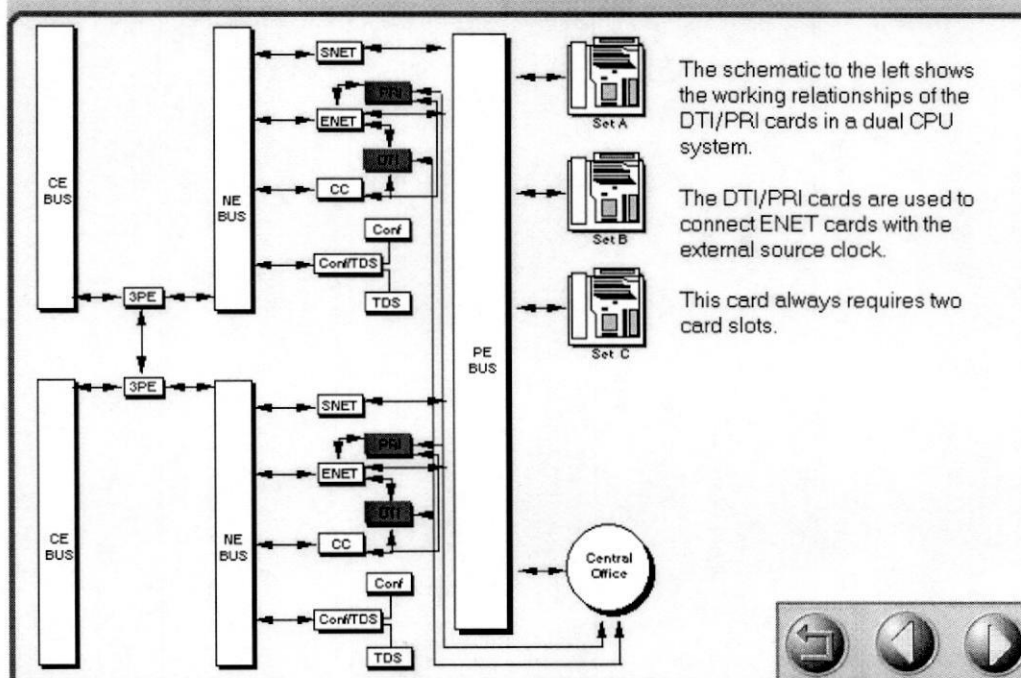
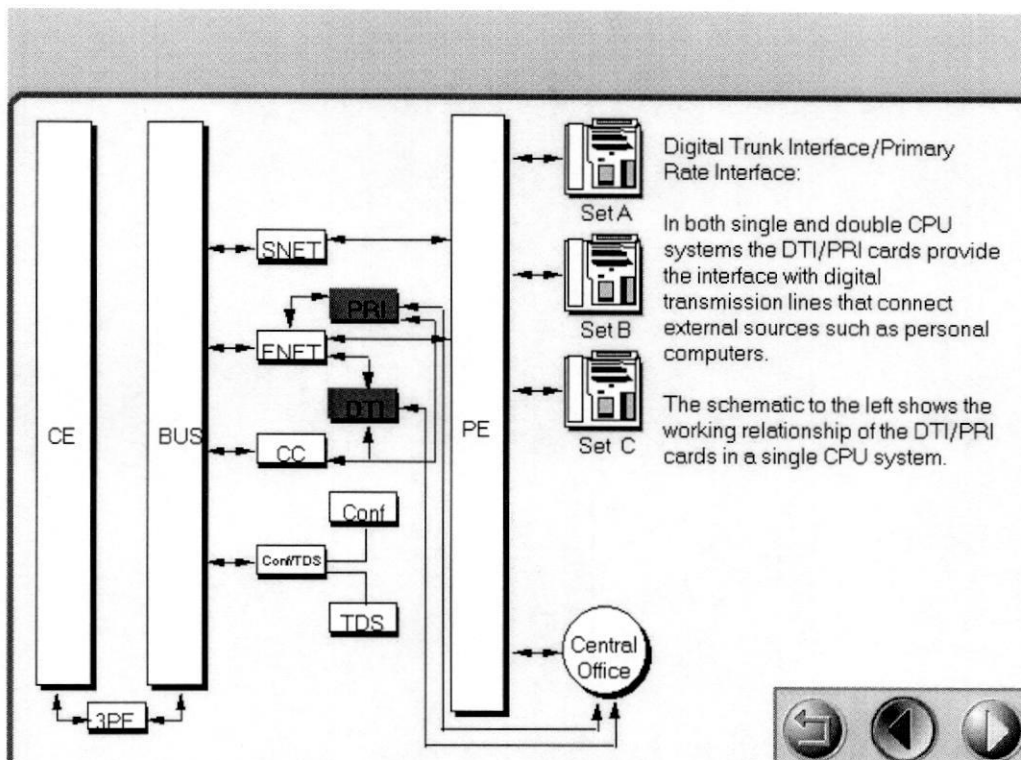
Peripheral Signaling:

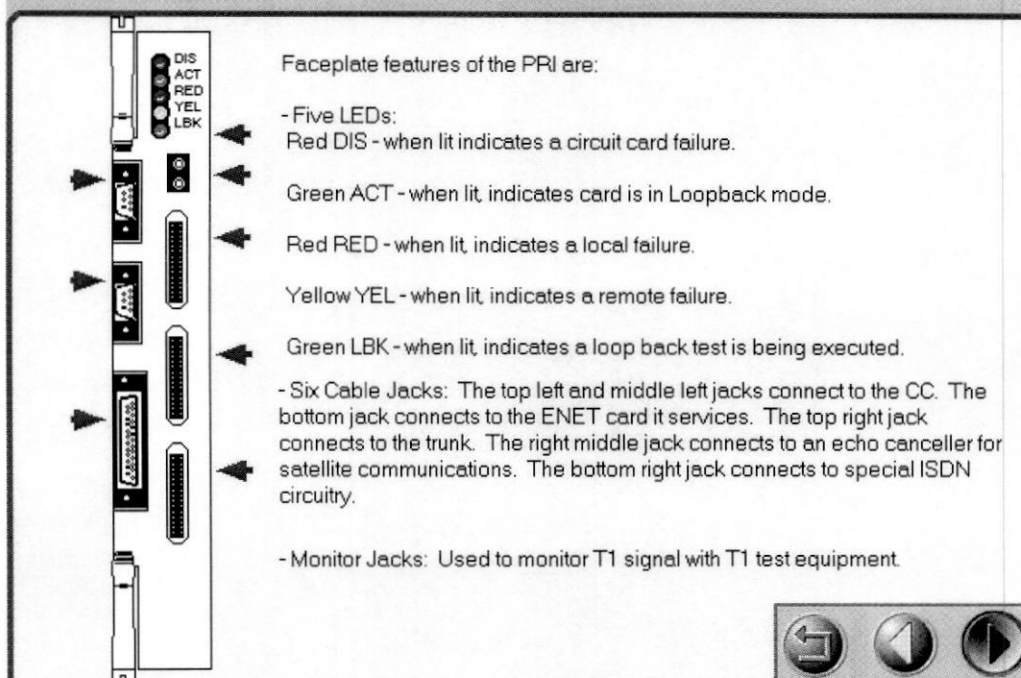
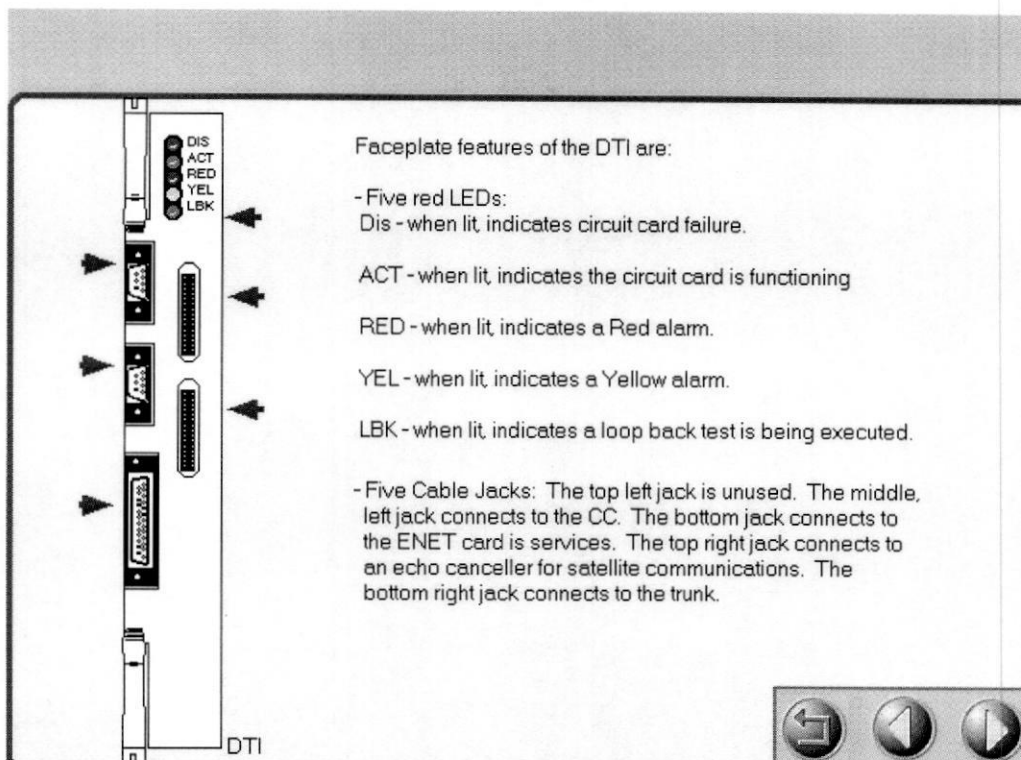
The PER SIG processes signals between the CPU and the peripheral equipment. The PER SIG buffers the signaling bits coming from the peripheral equipment until a complete signaling message is assembled.

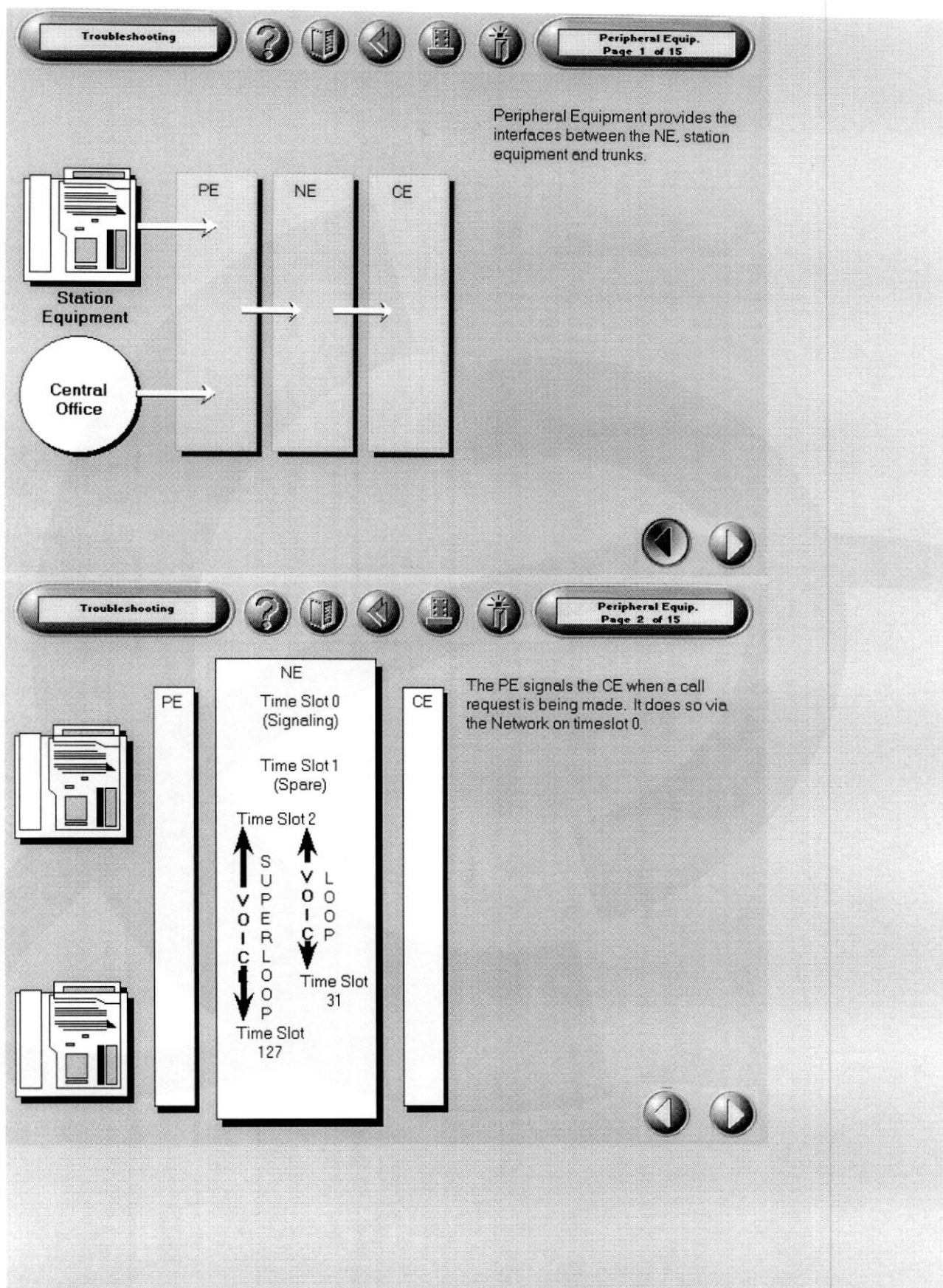


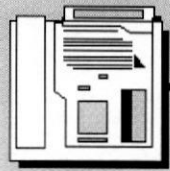








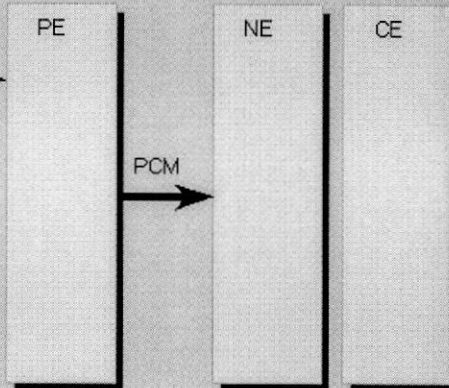




Digital

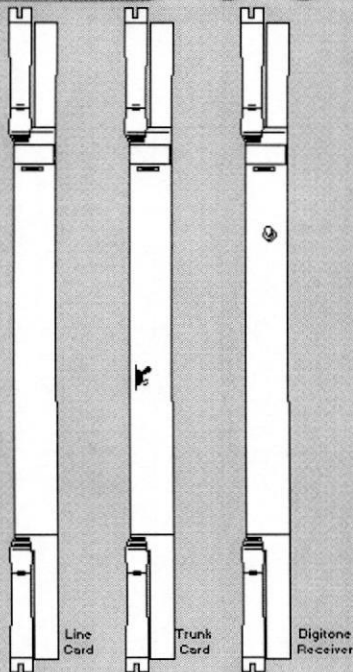


Analog



The PE ensures that the various signals from the different types of station equipment are in the proper format for the system during a call.

The proper format is Pulse Code Modulation, PCM.



Line Card

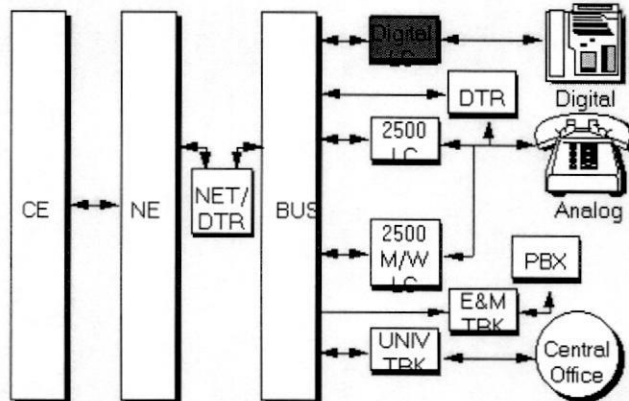
Trunk Card

Digitone Receiver

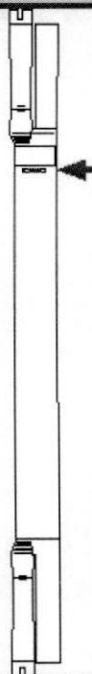
To accomplish the formatting, the PE uses the components shown.

Use your mouse to select each card for more information.



**Digital Line Card:**

Provides the voice, data and signaling interface for 16 digital integrated sets.

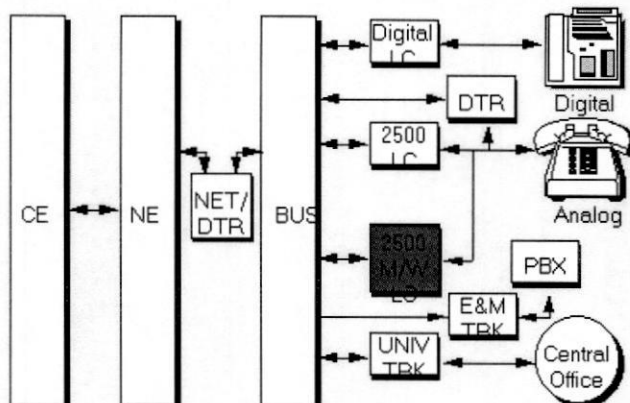


Faceplate feature of the Digital LD is:

- Red LED: When lit indicates the card is disabled and/or not programmed in software.

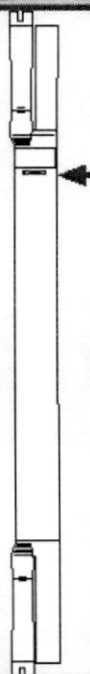
Message Waiting Line Card:

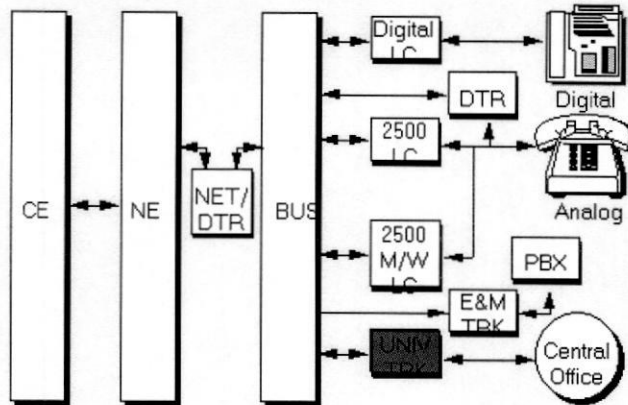
Provides the voice and data interface for 16 analog sets and includes message waiting circuitry.



The faceplate feature of the 2500 M/W LC is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.



**Universal Trunk Card:**

Provides eight interface connections from the trunk facility to the CE/PE bus. Each interface can be individually configured to operate as:

- a Central Office trunk
- a Direct Inward Dial trunk
- a Recorded Announcement trunk
- a Paging trunk

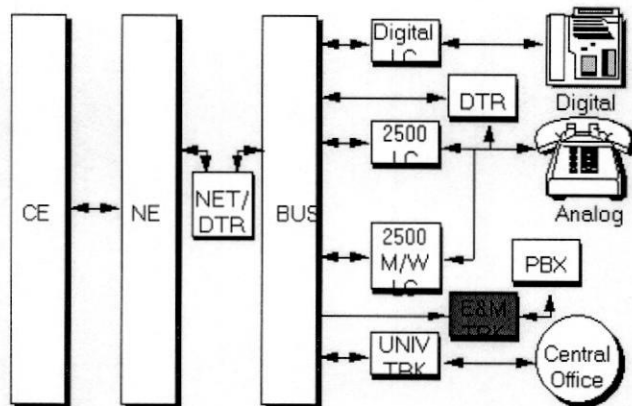


The faceplate feature of the Universal Trunk Card is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.

E and M Trunk Card:

Provides four analog Tie trunk interfaces.

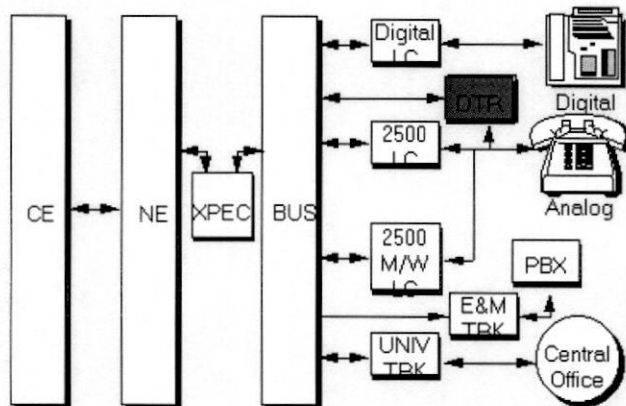


The faceplate feature of the E & M Trunk card is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.

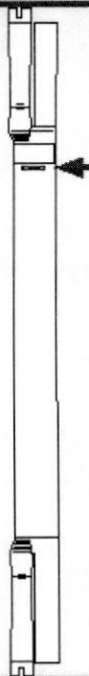
Digitone Receiver:

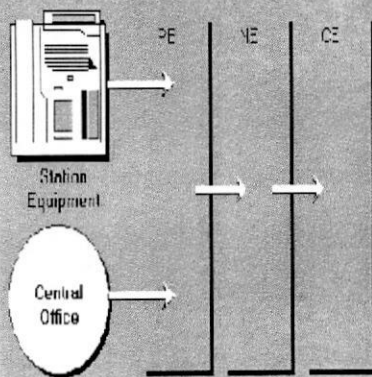
It is used to connect DTMF to digital signals for processing by the CPU for up to 8 analog sets.



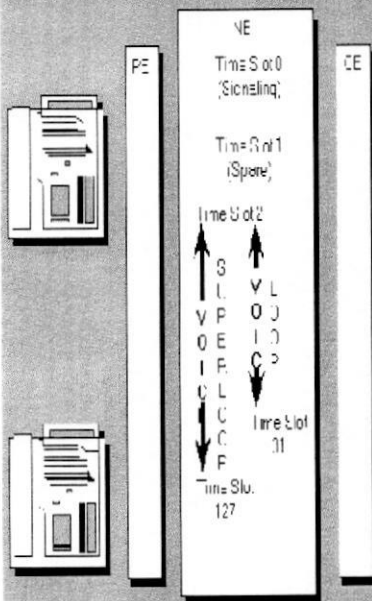
The faceplate feature of the DTR card is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.





Peripheral Equipment provides the interfaces between the NE, station equipment and trunks.



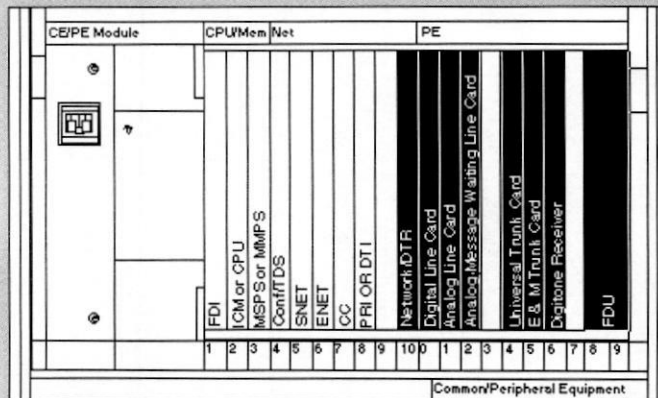
The PE signals the CE when a call request is being made. It does so via the Network on timeslot 0.

The Meridian 1 currently uses Intelligent Peripheral Equipment (IPE) for much of the Peripheral Equipment needed in the Options 21A through 81.

Intelligent Peripheral Equipment (IPE) cards are supported by Superloop Network card loops. The traffic requirements of all peripheral equipment cards provisioned on a particular network loop must match the traffic capacity of that loop.

PE cards are housed in the PE Module. IPE cards are housed in the IPE Module, or the CE/PE Module. PE and IPE cards cannot be mixed within a module.

CE/PE Peripheral Circuit cards:



This module provides CPU control, network switching, and peripheral equipment interface functions in Options 21A, 21 and 21E.

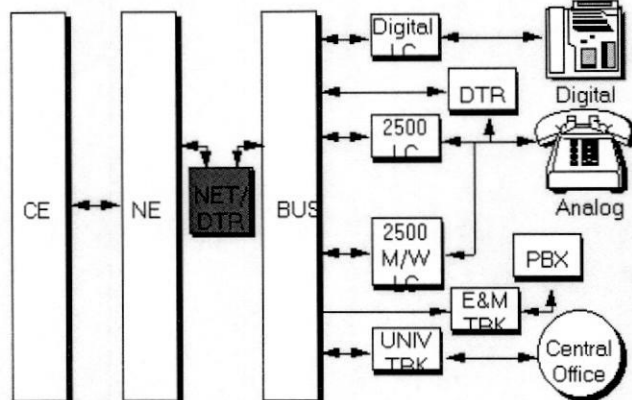
Slots 1 - 3 of the CE/PE Module contain Common equipment circuit cards. They are covered in lesson 2 of this chapter. Slots 4 - 9 contain Network equipment cards, which are covered in lesson 3 of this chapter.

Use your mouse to select each highlighted card for more information.

Network/DTR Card:

The Network/DTR card is required to access the right side PE slots 0-6 of the CE/PE shelf.

It allows for one superloop in the single tier option. Because of design, the superloop that the Network/DTR card addresses is number 28.

**Network/DTR Card:**

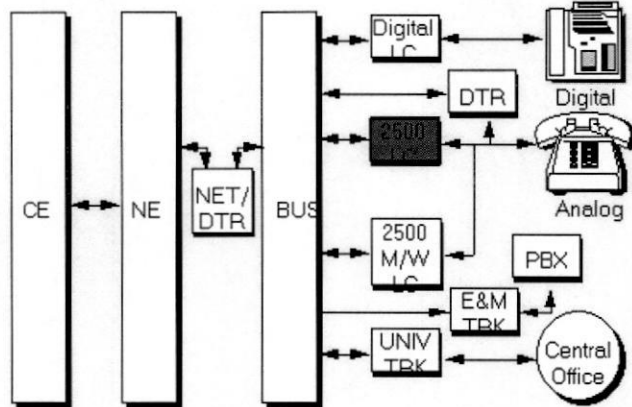
The Network/DTR card is located in slot 10. It combines the functionality of the Network Controller and Digitone Receiver cards in a single mother/daughter board assembly.

The motherboard contains the voice, data and signaling circuitry. The daughter board contains the Digitone Receiver Circuitry.



Faceplate features of the Network/DTR Card are:

- Red LED: When lit, this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.

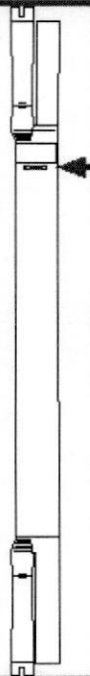
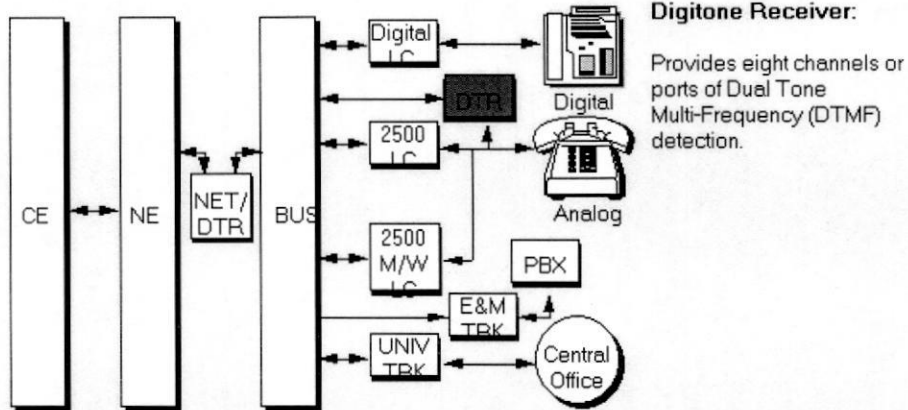
**Analog Line Card:**

Provides the voice and data interface for 16 analog sets.



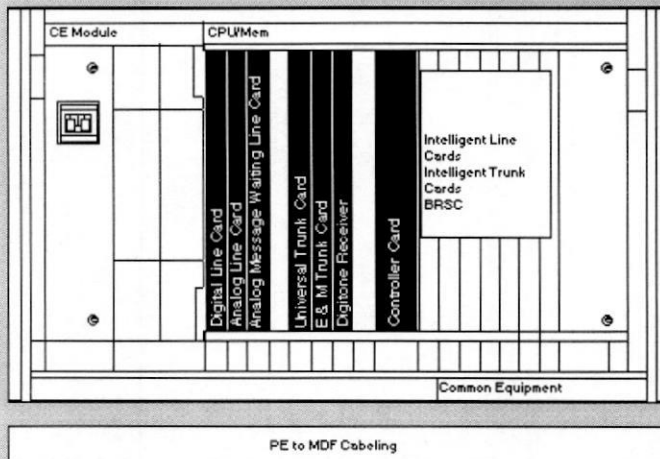
Faceplate feature of the 2500 Analog Line Card is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.



The faceplate feature of the DTMF Card is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.



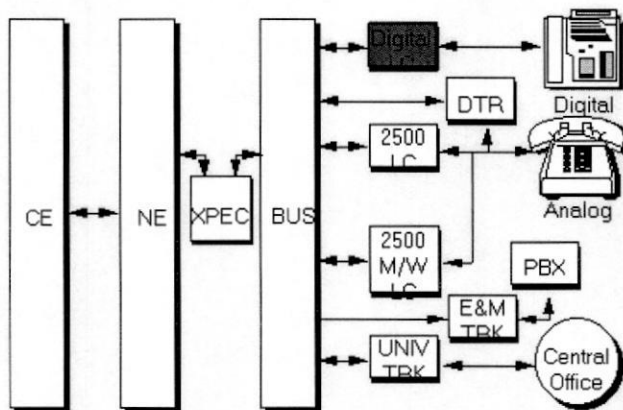
The Intelligent Peripheral Equipment (IPE) Module uses slots 0 through 15 to house IPE circuit cards.

Use your mouse to select each highlighted card for more information.



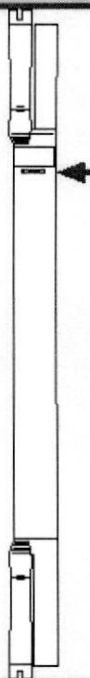
Digital Line Card:

Provides the voice, data and signaling interface for 16 digital integrated sets.



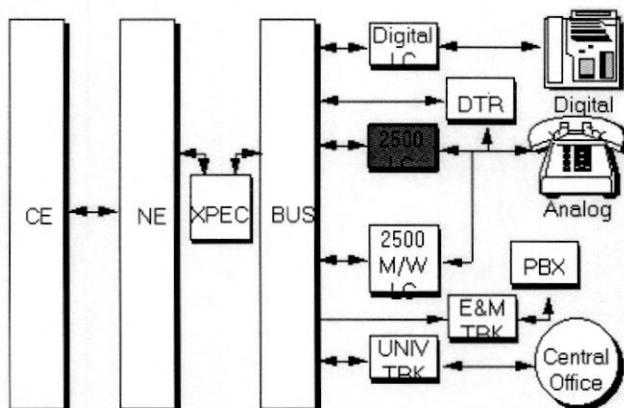
The faceplate feature of the Digital LC is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.



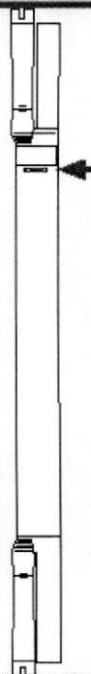
Analog Line Cards:

Provide the voice and data interface for 16 analog sets.



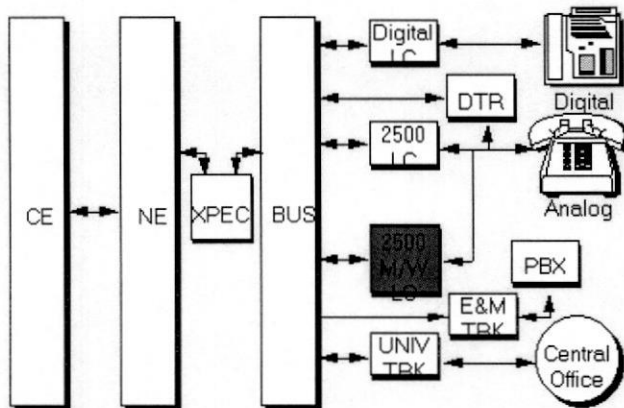
The faceplate feature of the 2500/Analog LD is:

- Red LED: When lit indicates the card is disabled and/or not programmed in software.



Message Waiting Line Card:

Provides the voice and data interface for 8 analog sets and includes message waiting circuitry.



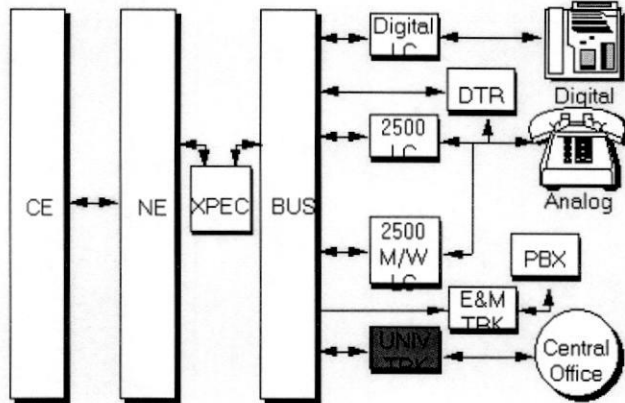
The faceplate feature of the 2500/Analog M/W LC is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.



Universal Trunk Card:

Provides eight interface connections from the trunk facility to the CE/PE bus. Each interface can be individually configured to operate as:



- a Central Office trunk
- a Direct Inward Dialing trunk
- a Recorded Announcement trunk
- a Paging trunk

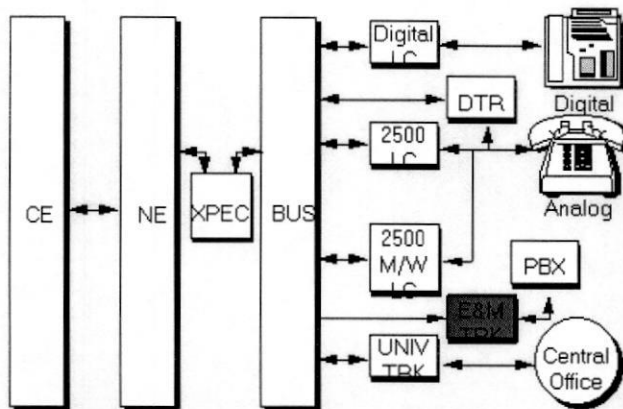
The faceplate feature of the Universal Trunk Card is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.



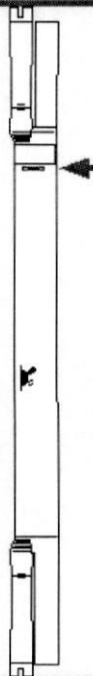
E and M Trunk Card:

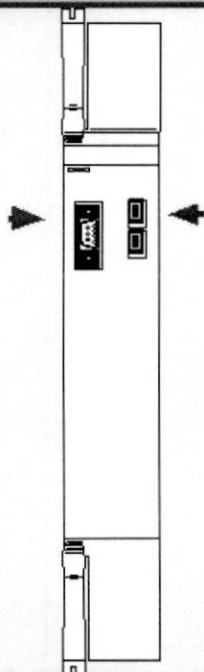
Provides four analog TIE trunk interfaces.



The faceplate feature of the E & M Trunk Card is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.

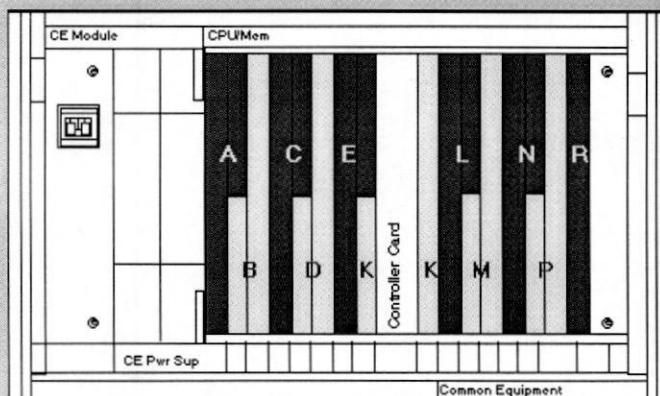




- Two Digit Maintenance Display: In the normal state the display will alternately flash the card's ID and a tracking status. Refer to the Input/Output manual, LD 32, for a list of the tracking codes and their meaning.

If a fault occurs, the display will indicate the condition of the line between the Controller Card and the SNet it services.

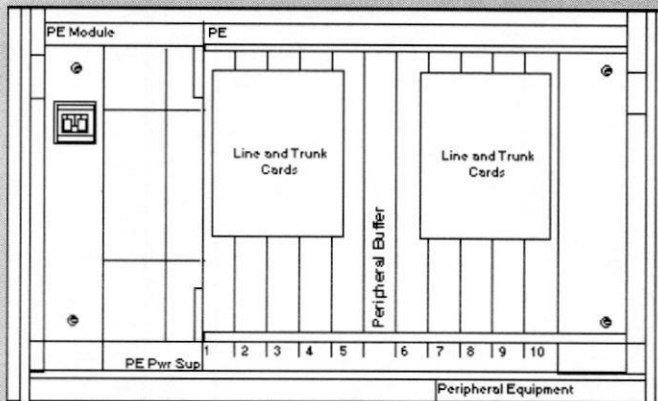
- One Cable Jack: Reserved for future use.



PE Cables connect the Line Cards with Terminal devices via the Main Distribution Frame (MDF).

The cable designator for each card slot is shown. Each cable services one and one half line cards.



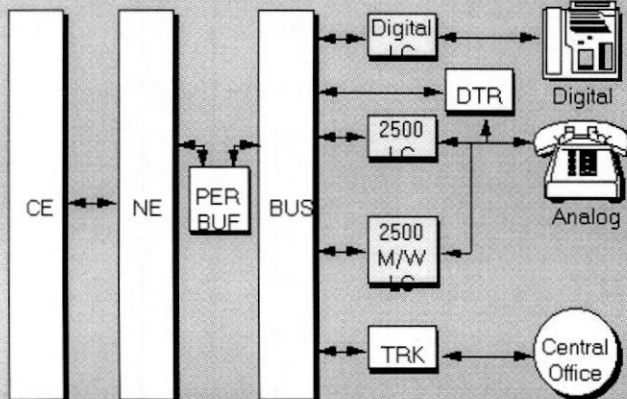


PE to MDF Cabling

Peripheral Equipment Module (PE):

This module provides the interface between Network switching and peripheral equipment cards.

This module does not support Intelligent Peripheral Equipment (IPE) cards.



Digital Line Cards:

Supports voice only or simultaneous voice and data service over a single twisted pair of standard telephone wiring.

Analog Line Cards:

Provides talk battery and signaling for regular 2-wire common battery 500-type and 2500-type telephones and key telephone equipment.

Message Waiting Line Card:

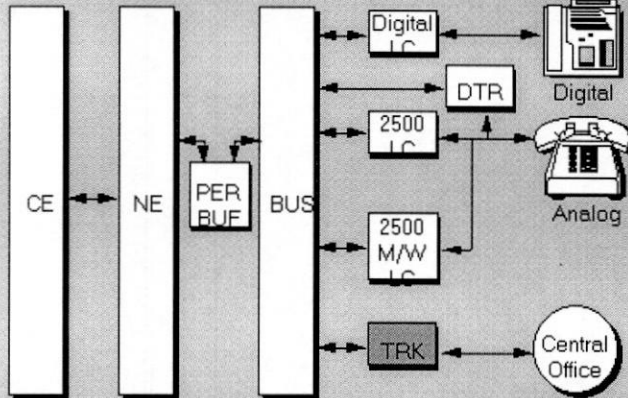
Provides the voice and data interface for 8 analog sets and includes message waiting circuitry.

Trunk:

Provides four interface connections from the trunk facility to the Peripheral Equipment bus.

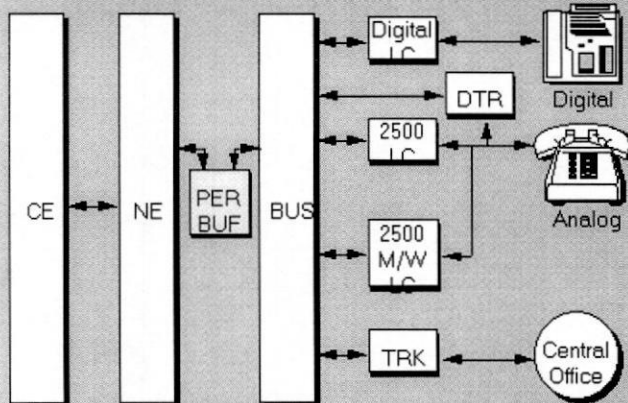
Different trunk cards can be used to provide:

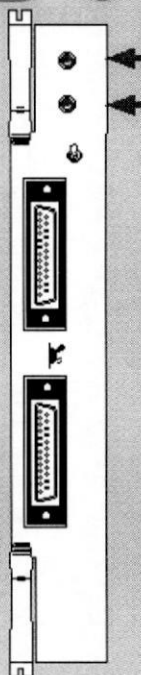
- a Central Office trunk
- a Direct Inward Dialing Trunk
- a Recorded Announcement Trunk
- a Paging Trunk

**Dual Loop Peripheral Buffer:**

Provides line driving, receiving, buffering and level shifting between one or two NE loops and the PE bus.

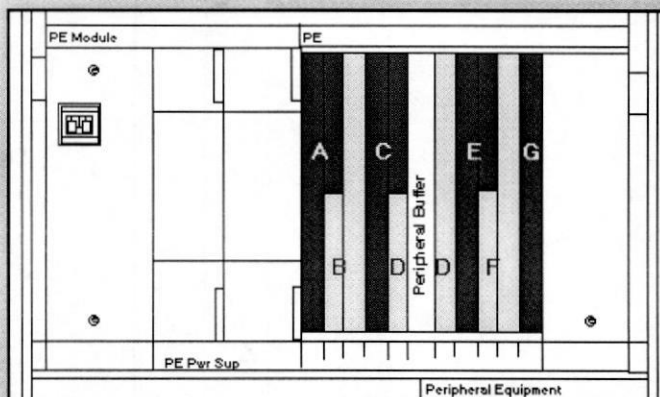
Also provides power regulation for 10 peripheral circuit cards.





Faceplate features of the Dual Loop Buffer are:

- Two Red LEDs: The top LED, when lit, indicates a loss of power. The bottom LED, when lit, indicates the card is disabled.

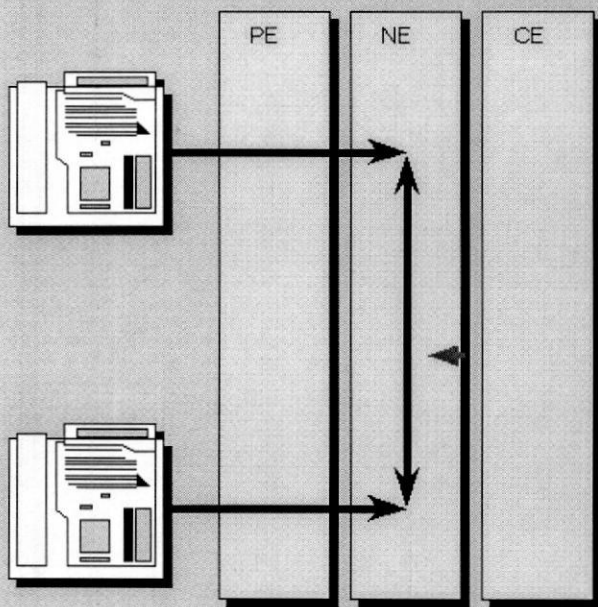


PE to MDF Cabeling

PE cables connect the Line Cards with the Terminal Devices via the MDF. The cable designator for each card slot is shown.

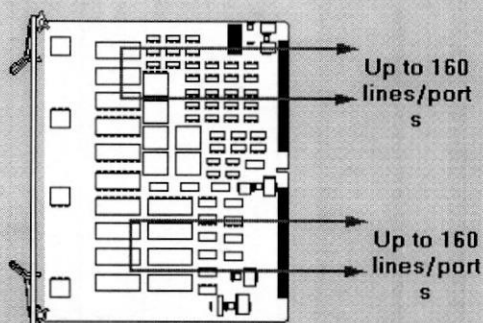
Each cable services one and a half line cards, except for the last one which services one.

This is the last page of lesson four. Use the up one level button to return to the lesson menu. If you would like to review information in this lesson, use the back arrow below.



El equipo de red ejecuta la conmutación actual de información entre conexiones de teléfonos y de datos.

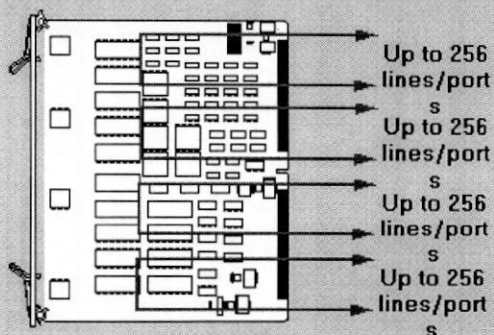
La conmutación es ejecutada bajo el control del CPU.

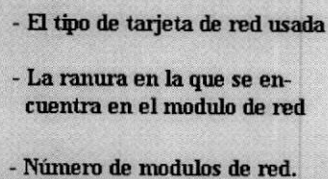
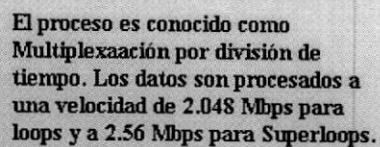


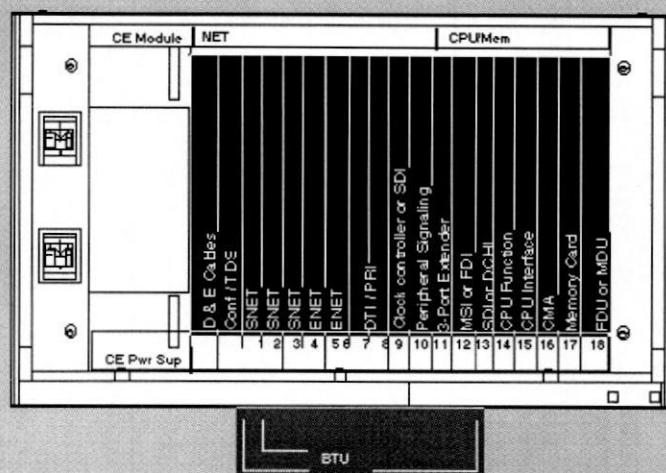
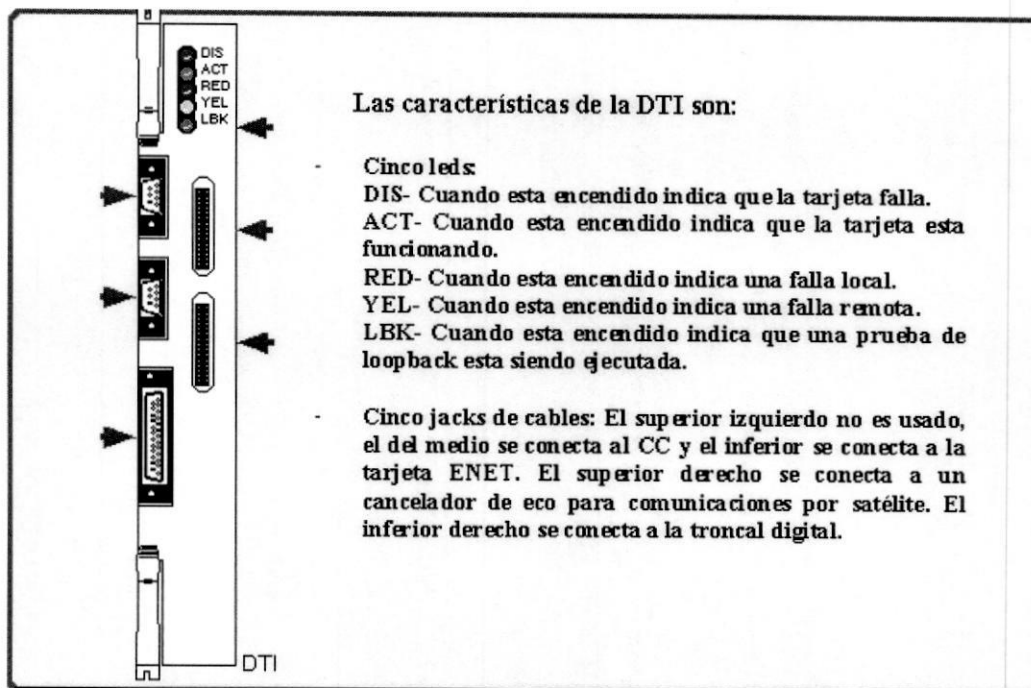
Las tarjetas de red pueden usar 2 ó 4 loops para formar una ruta de comunicación.

Hay 2 tipos de tarjetas las cuales proveen loops. Una tarjeta ENET (Enhanced Network) la cual provee 2 loops. Una tarjeta SNET (Superloop Network) la cual provee 4 loops.

Un loop soporta hasta 160 líneas/puertos por shelf. Un Superloop soporta hasta 512 líneas/puertos por shelf.

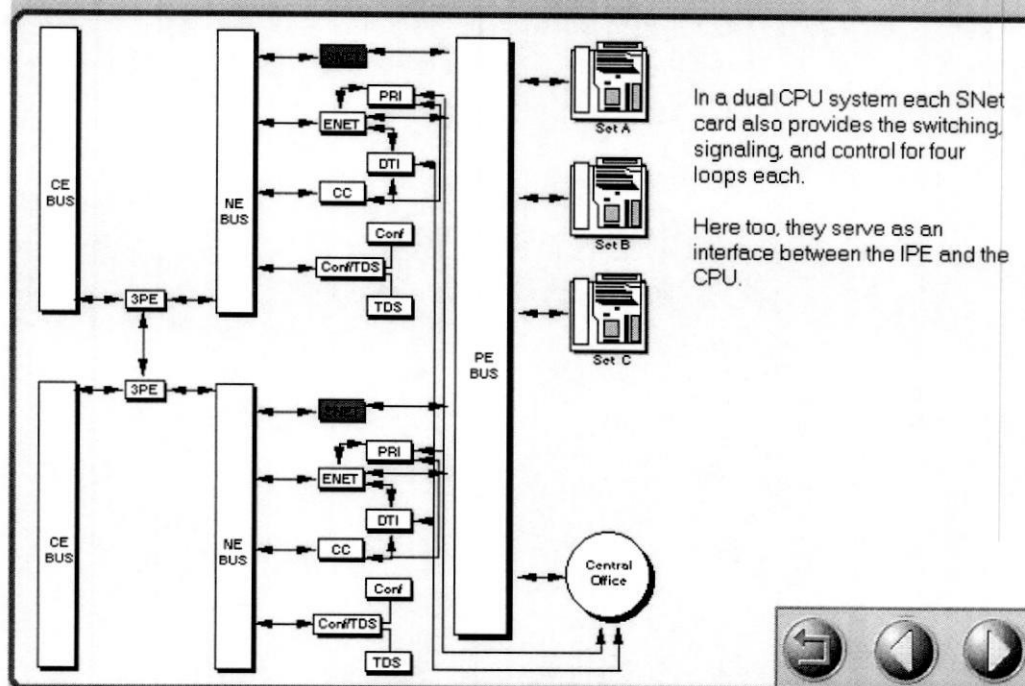
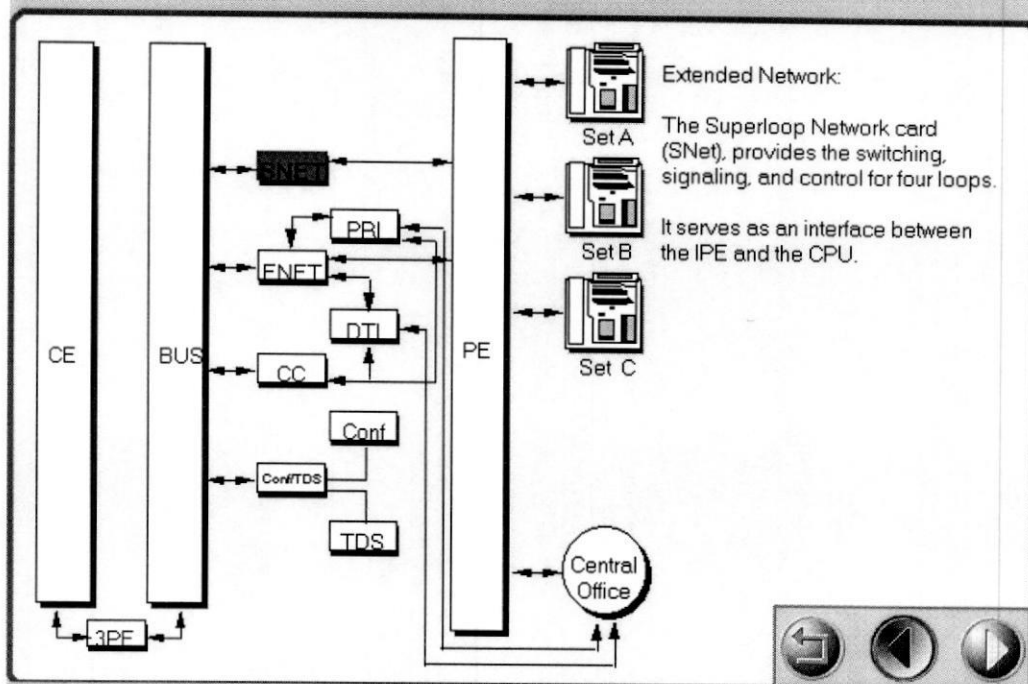


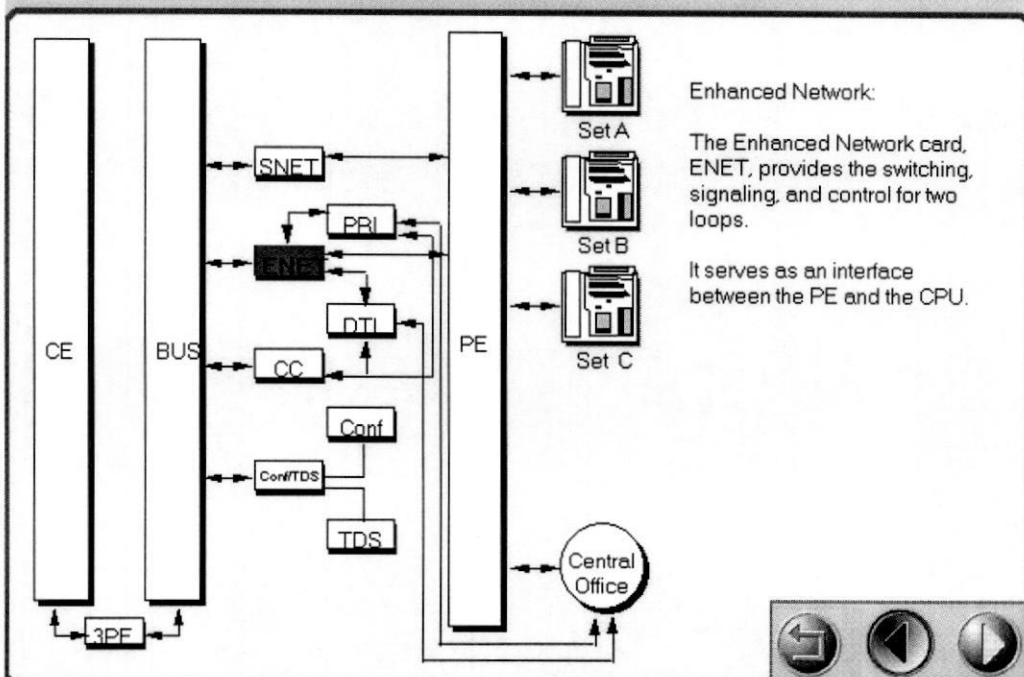
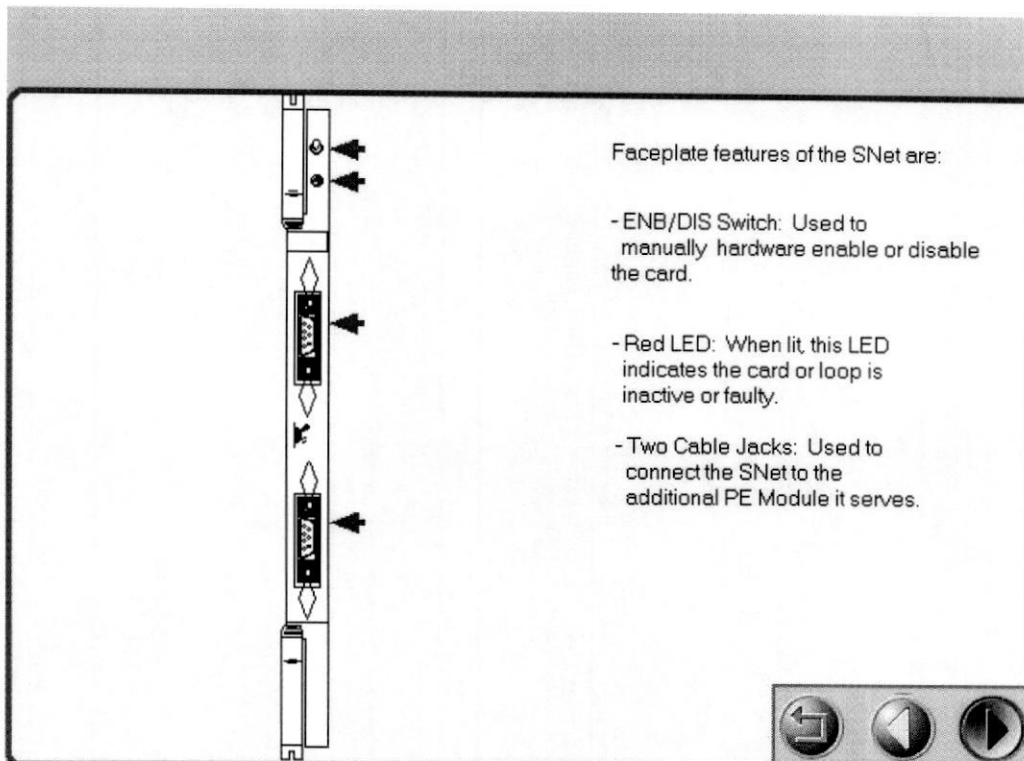


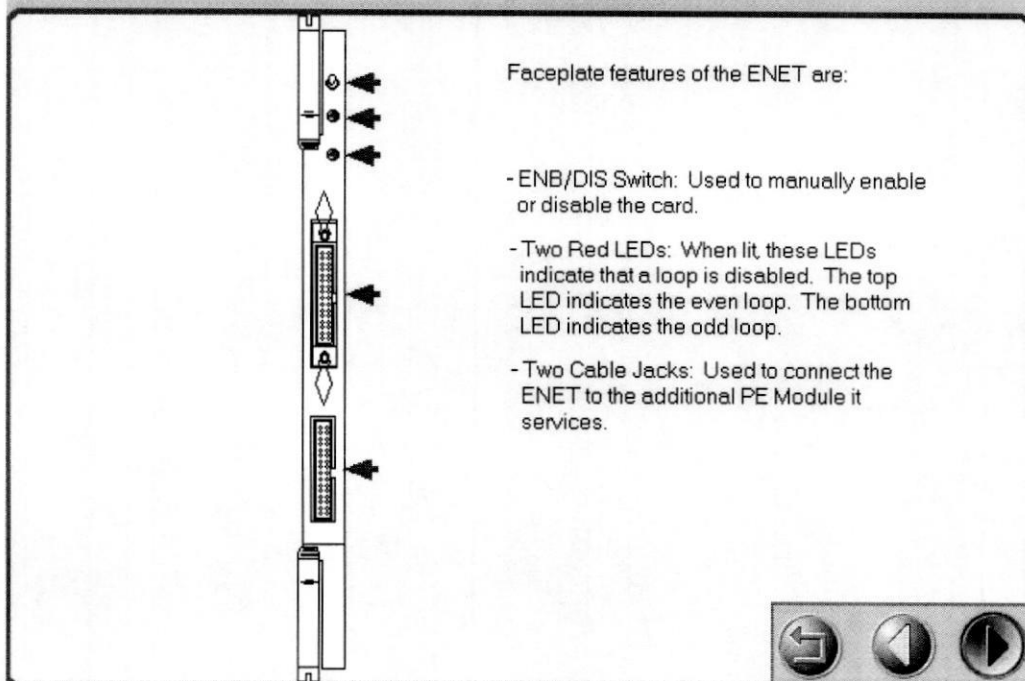
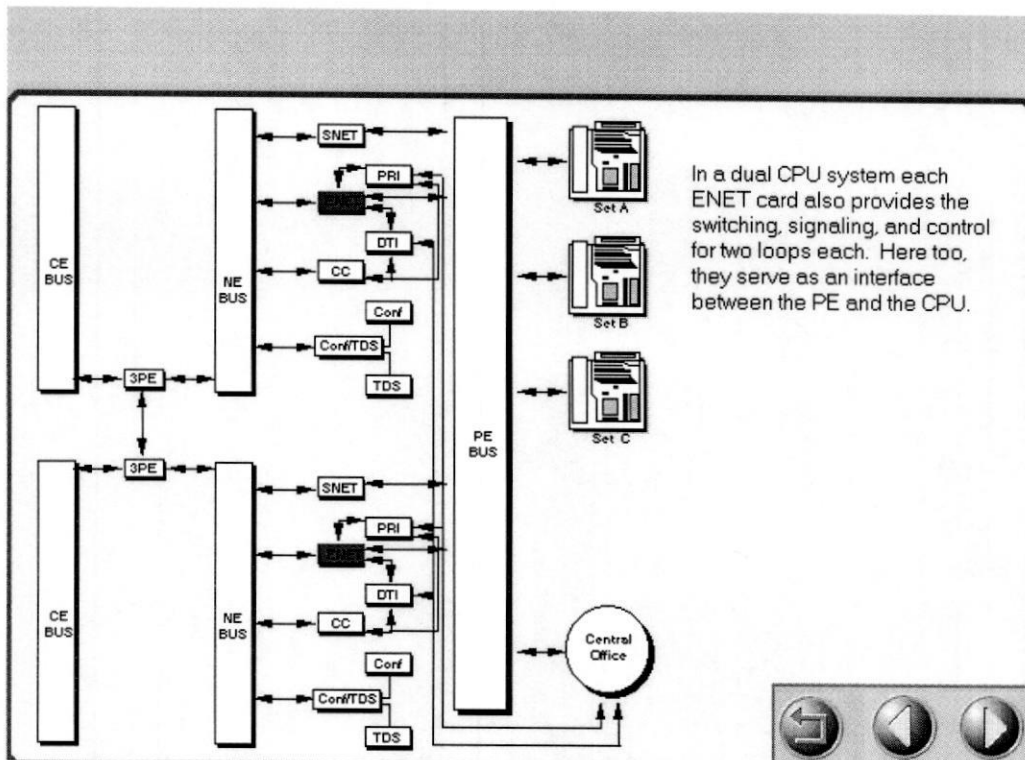


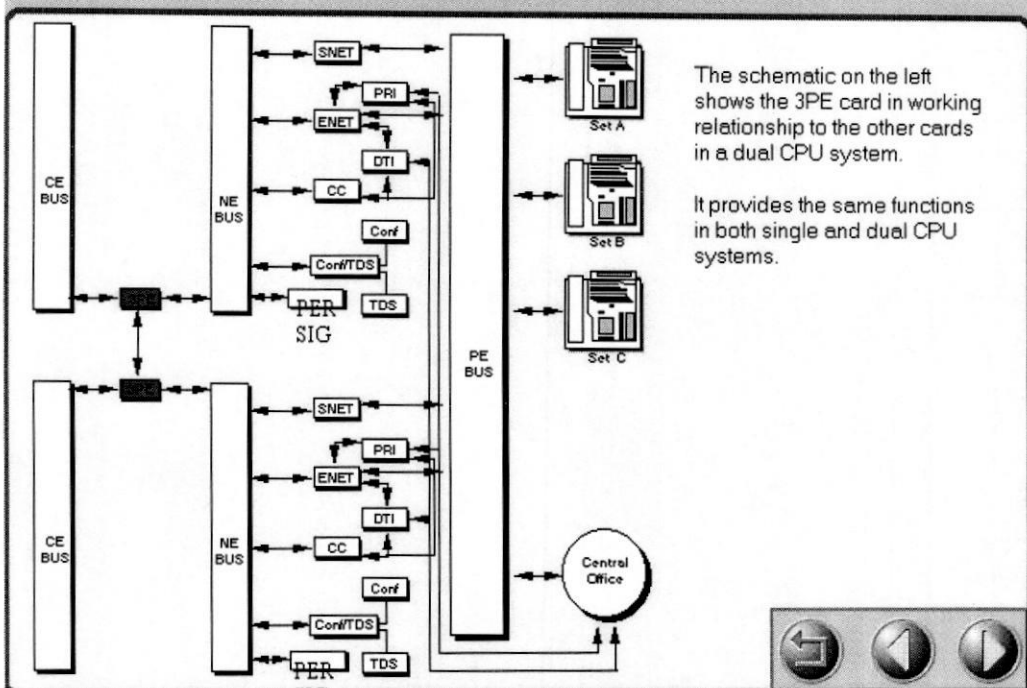
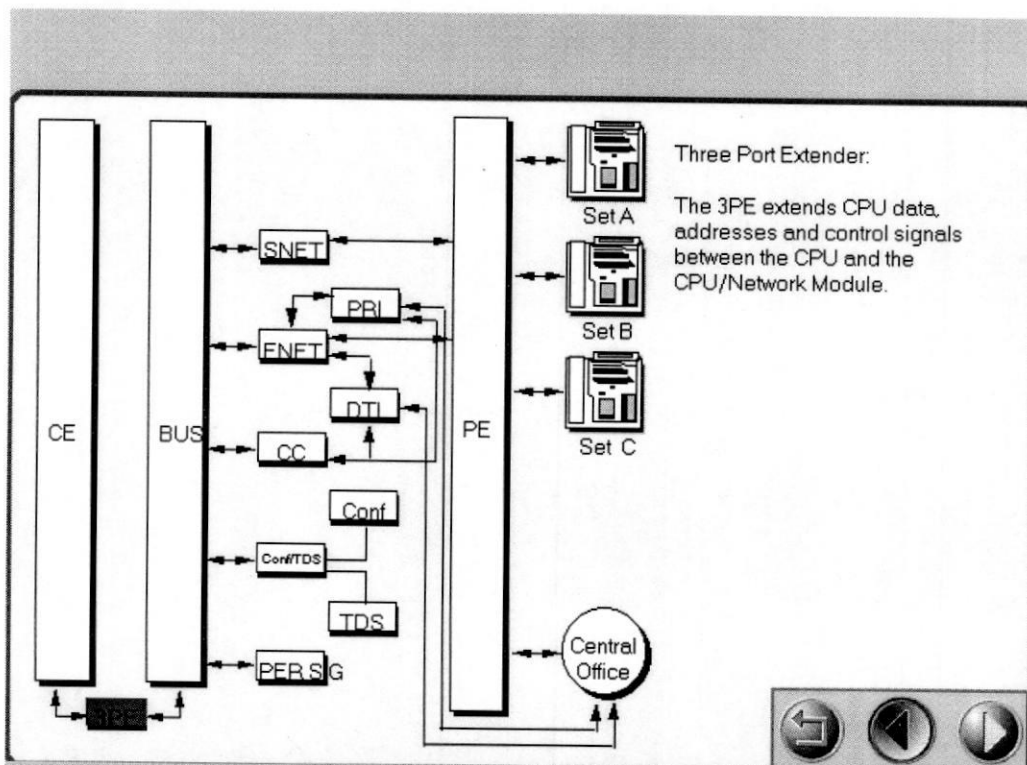
Módulo CPU/Network (CNE):

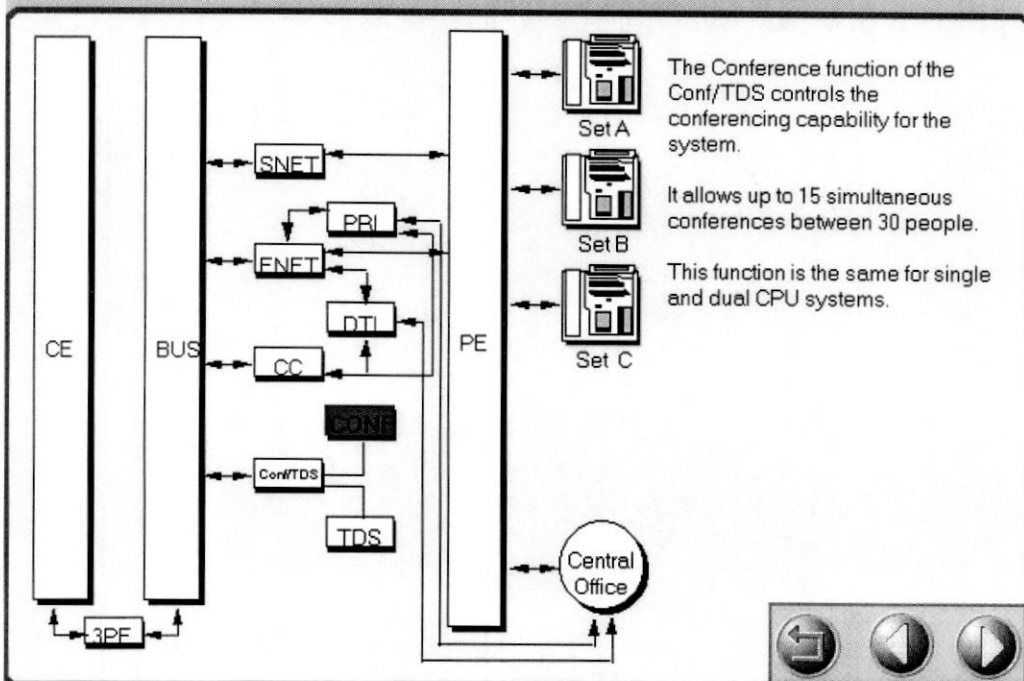
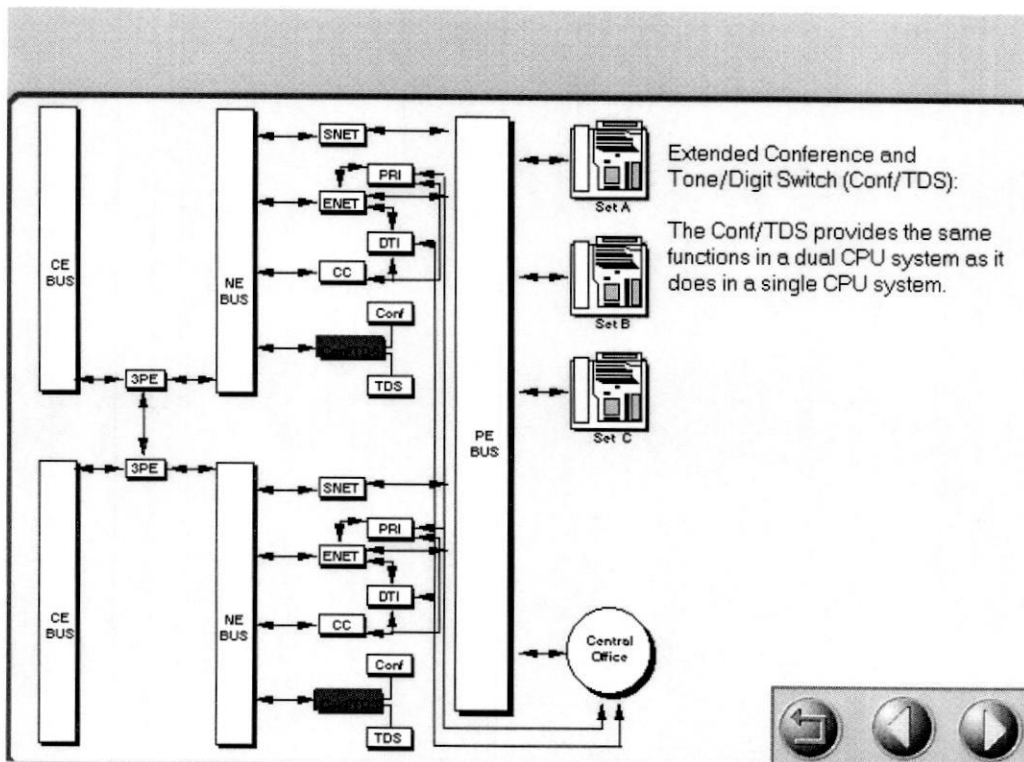
El módulo CNE provee las funciones de conmutación de red y control del CPU en las opciones 51 y 61. Los primeros 11 slots del módulo CNE son usados para alojar equipo de red.

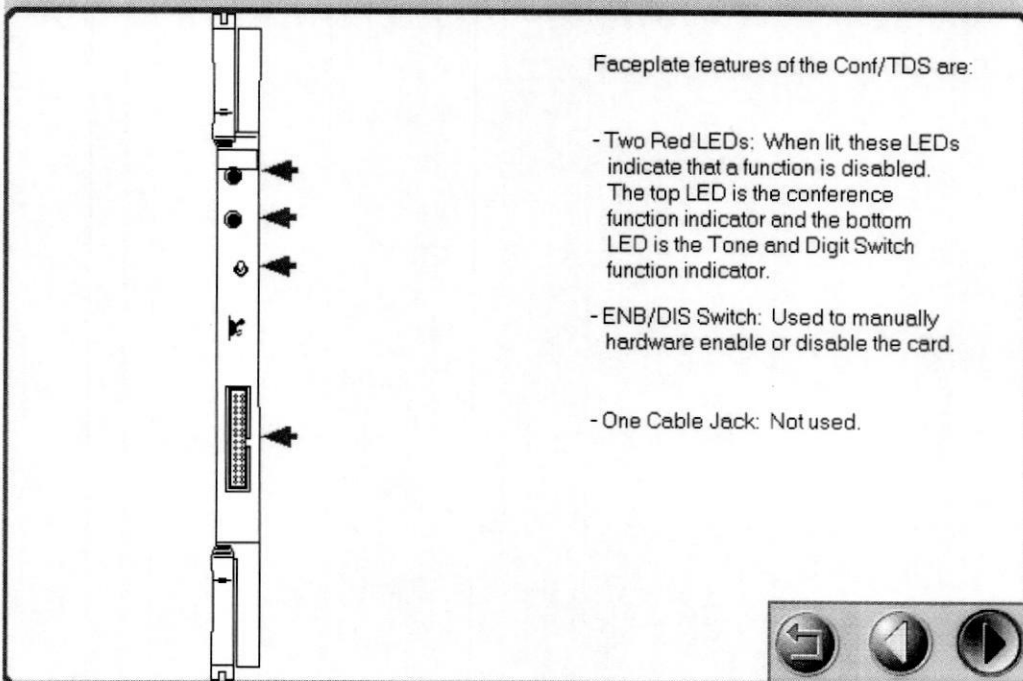
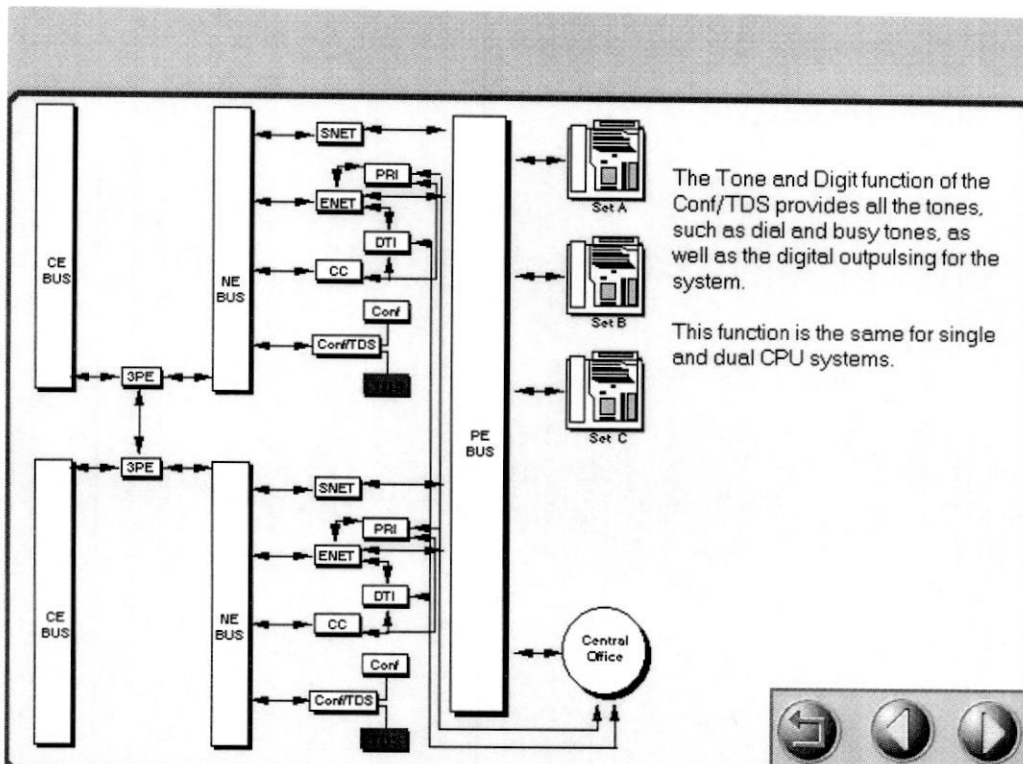


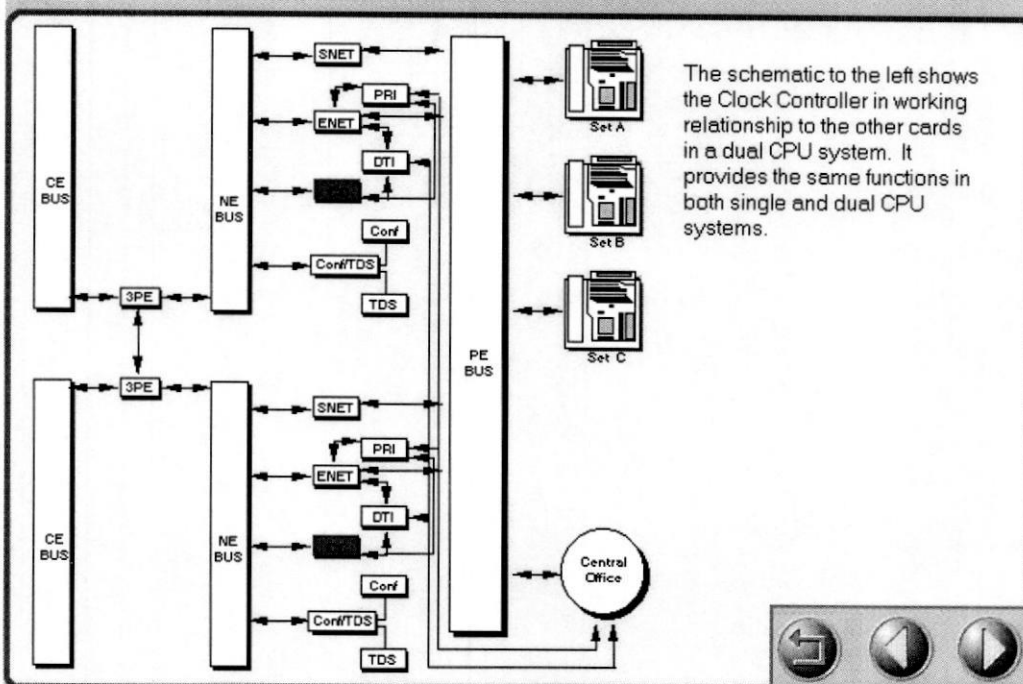
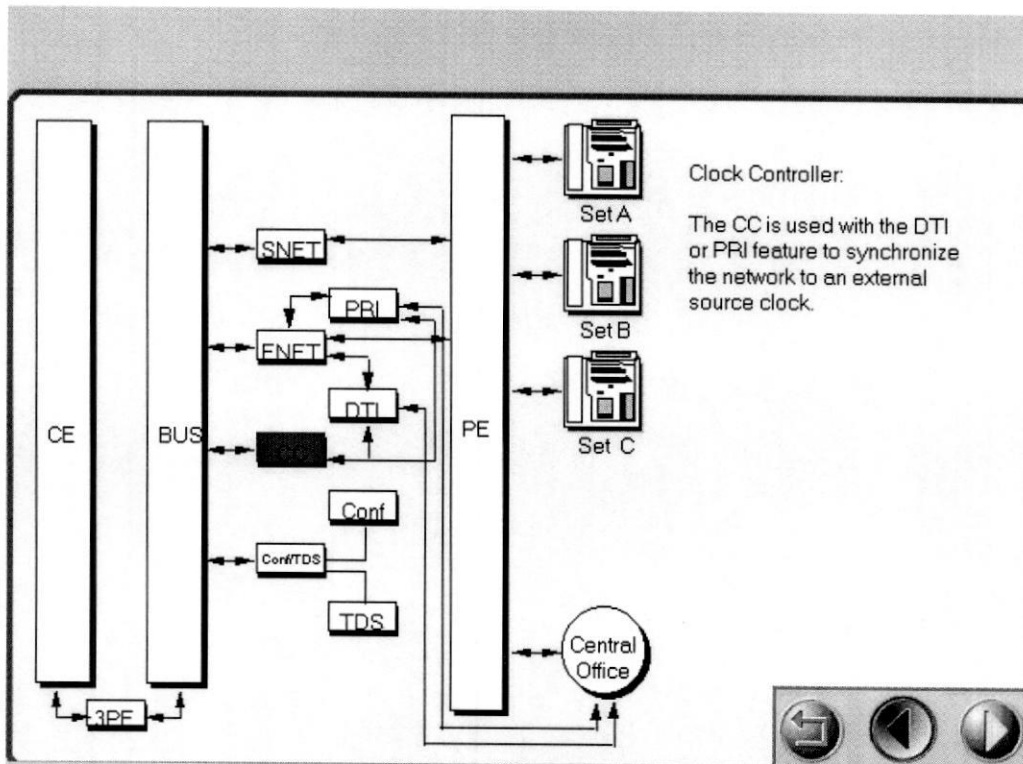








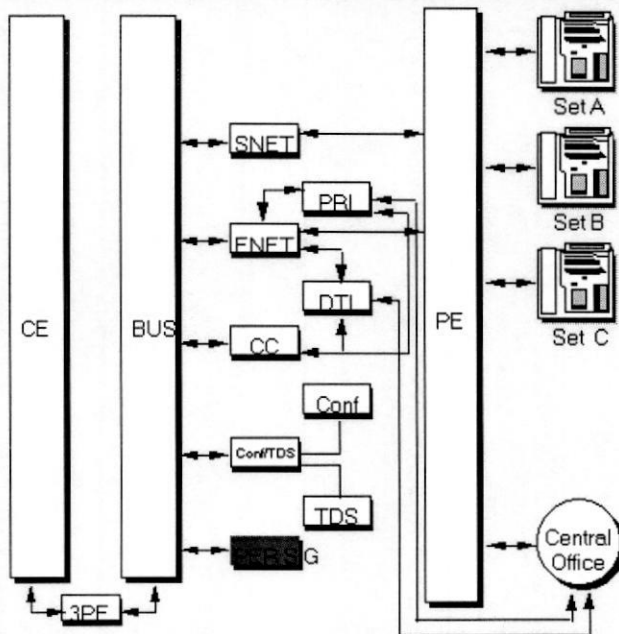






Faceplate features of the CC are:

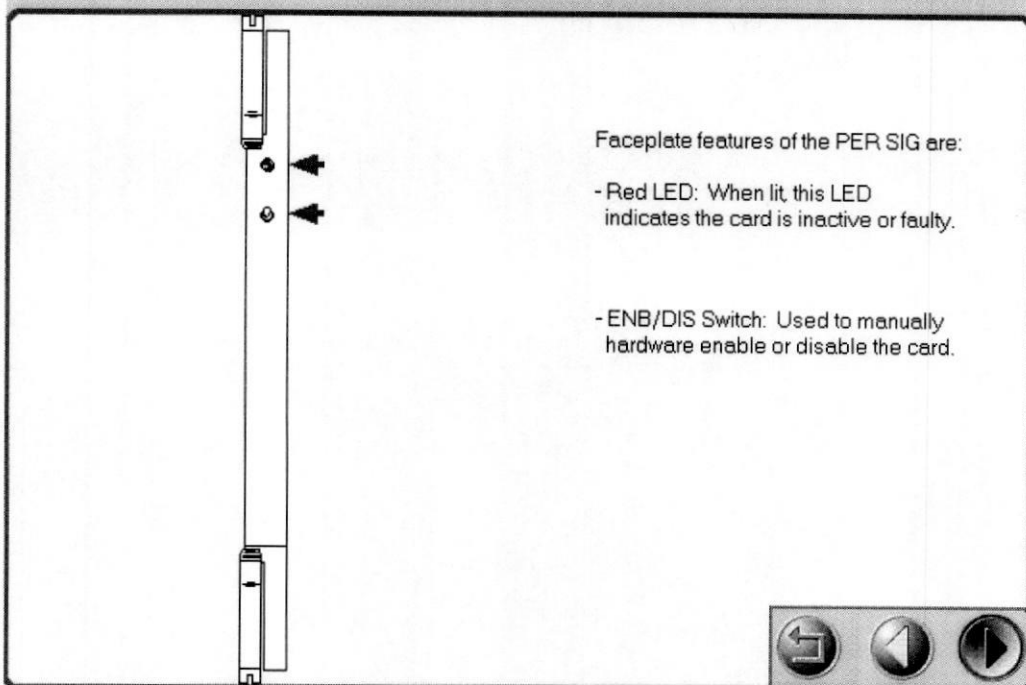
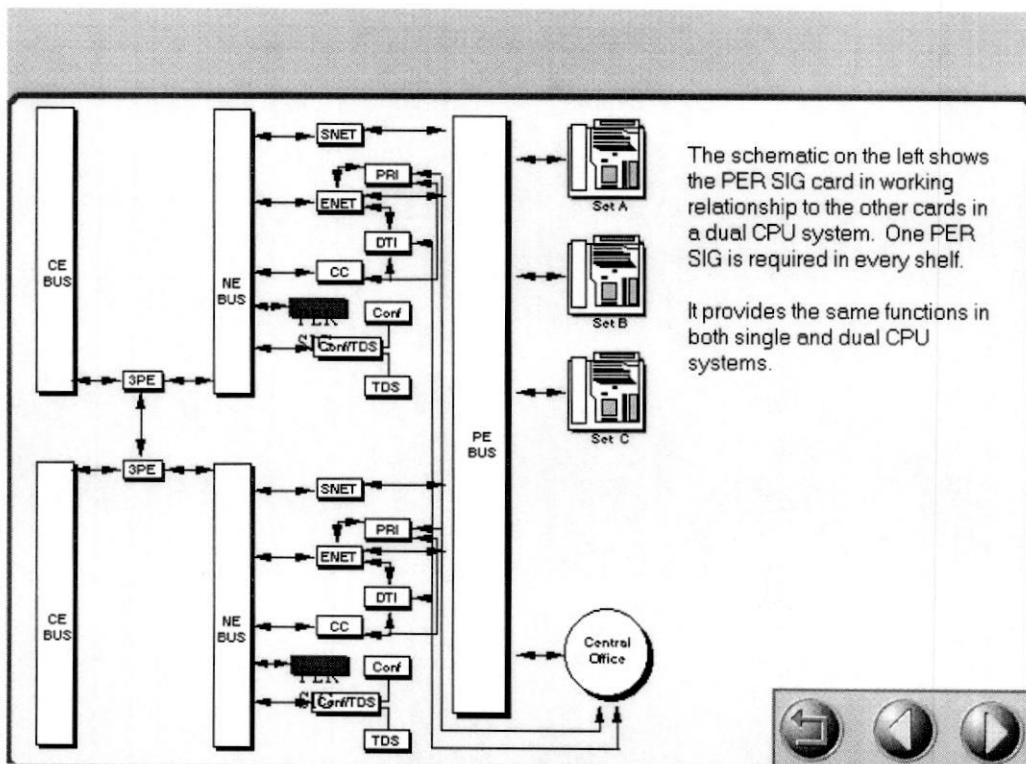
- Red LED: When lit this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Three Cable Connectors: The top two jacks are used to connect to primary and secondary reference sources (secondary may not be required) which are DTI/PRI cards. The Bottom jack is used to connect the two Clock Controllers together in dual CPU systems.

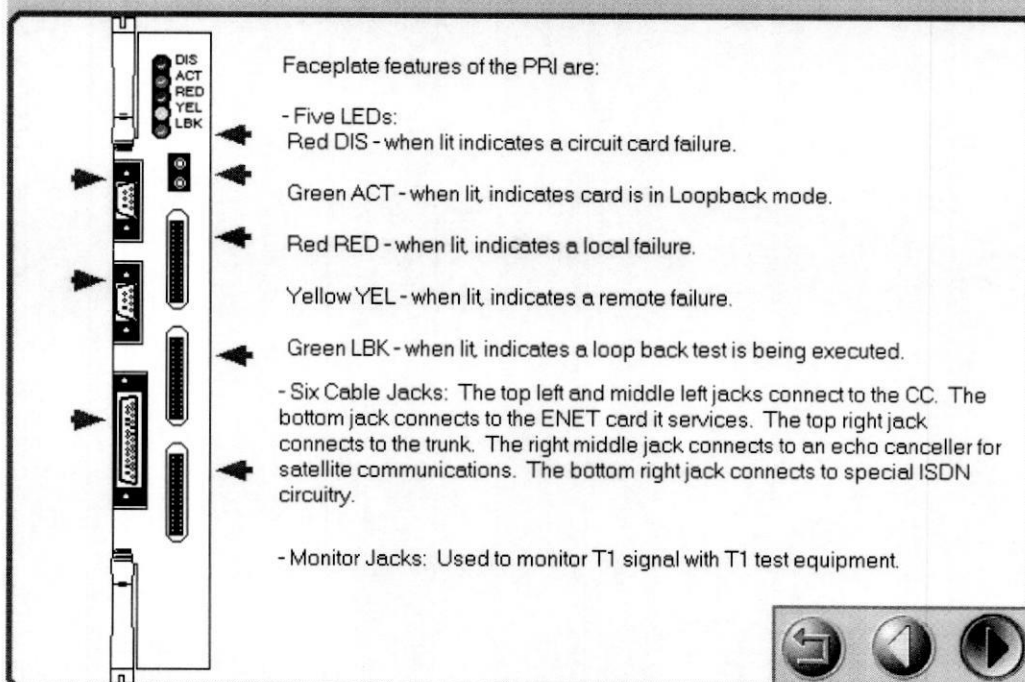
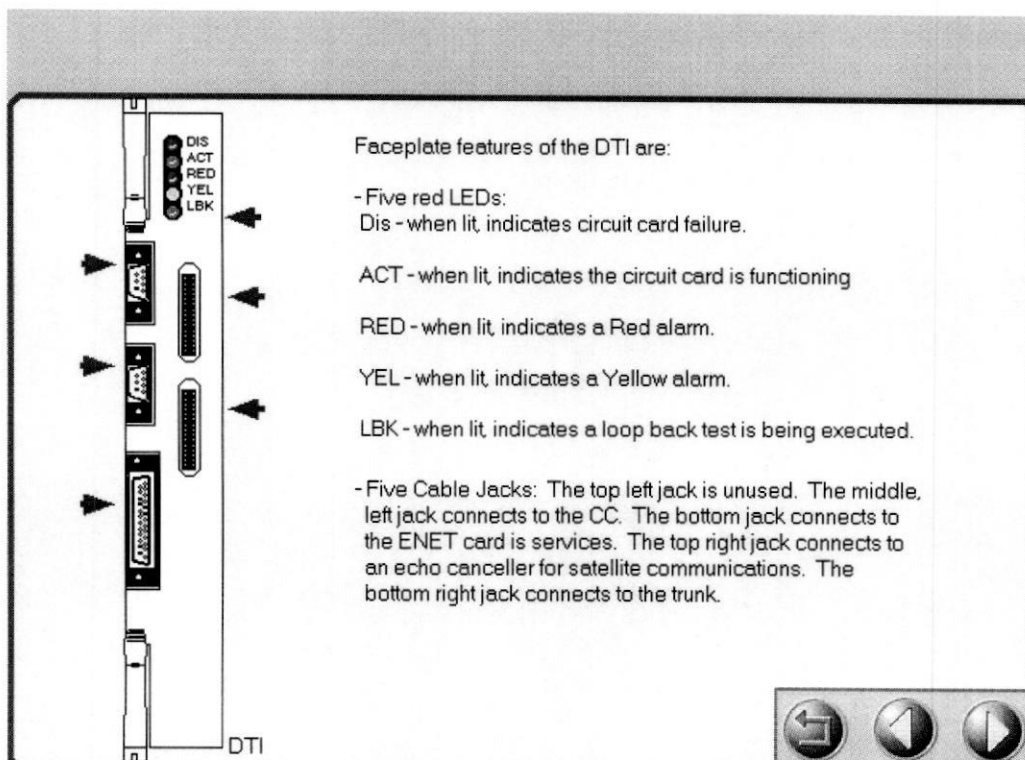


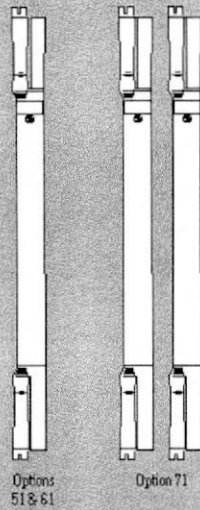
Peripheral Signaling:

The PER SIG processes signals between the CPU and the peripheral equipment. The PER SIG buffers the signaling bits coming from the peripheral equipment until a complete signaling message is assembled.









Options 51, 61, and 71 house their RAM on 6 Mbyte Memory circuit cards. In Options 51 and 61, there is a maximum of one 6 Mbyte Memory circuit card per CPU, while in the Option 71 the maximum is two.



In the Option 81 a single Cell Processor card houses 16 Mbytes of memory. This memory portion is designed to accommodate six commercial Single In-line Memory Modules (SIMMS) for a potential capacity of 96 Mbytes if 16 Mbyte SIMMS are used.



Options:
51 & 61

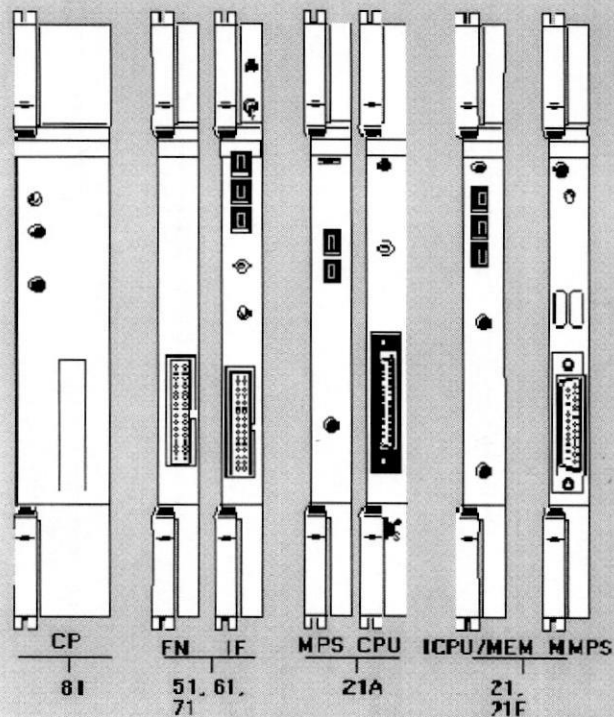


Option 71

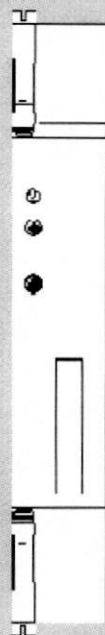
Options 51, 61, and 71 house their RAM on 8 Mbyte Memory circuit cards. In Options 51 and 61, there is a maximum of one 8 Mbyte Memory circuit card per CPL, while in the Option 71 the maximum is two.



In the Option 610 single CPU Processor card houses 16 Mbytes of memory. This memory port on is designed to accommodate six commercial Single In-line Memory Modules (SIMMS) for a potential capacity of 96 Mbytes if 16 Mbyte SIMMS are used.

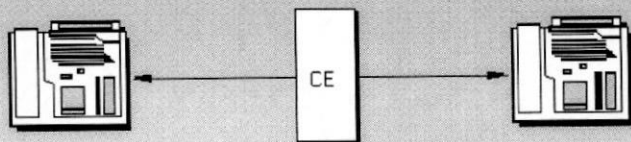


En las opciones 21 hasta 81, el CPU estaba constituido por dos tarjetas. Una tarjeta de función (FN) y una tarjeta de interface (IF).

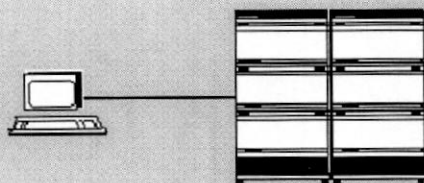
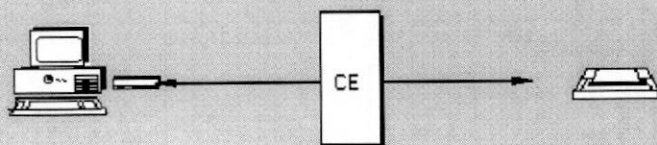


La opción 61 tiene un módulo CORE el cual ejecuta las funciones de procesamiento central para esta máquina.

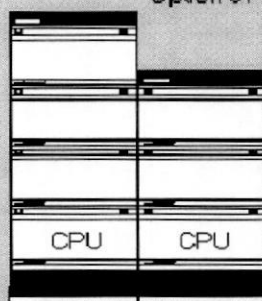
La tarjeta procesadora de llamadas (Call Processor CP) provee las funciones que realizan las tarjetas FN y IF en las plataformas anteriores.



El equipo común provee control central para todas las conexiones de teléfonos y datos y monitorea la actividad de la llamada. También provee las funciones de administración, mantenimiento y prueba.

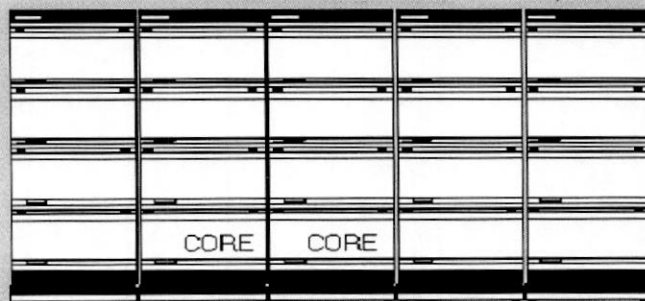


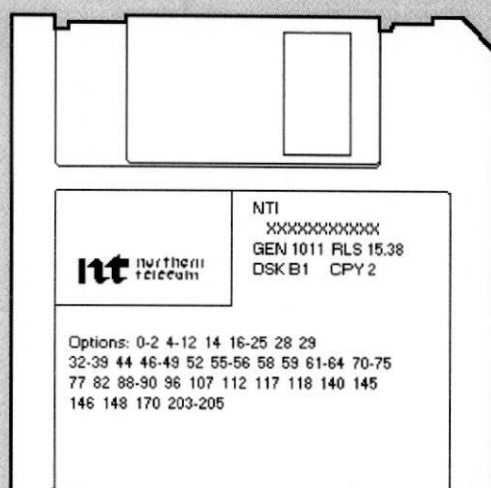
Option 61



El equipo común ejecuta sus funciones usando dos principales componentes, la Unidad de Procesamiento Central (CPU) ó Módulo CORE, y la información que se encuentra almacenada.

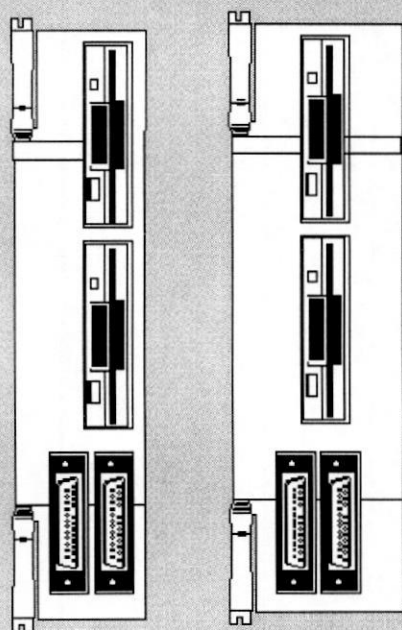
Option 81





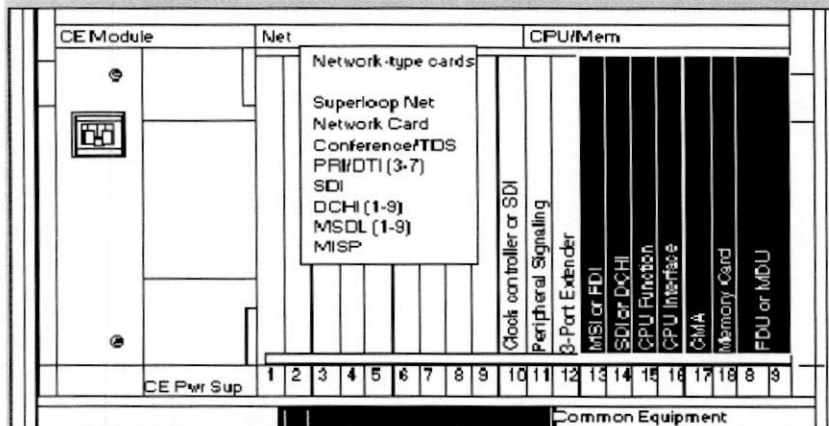
Mass Storage provides a non-volatile back-up for RAM.

Maintenance diagnostics are stored on and retrieved from Mass Storage when they are needed.



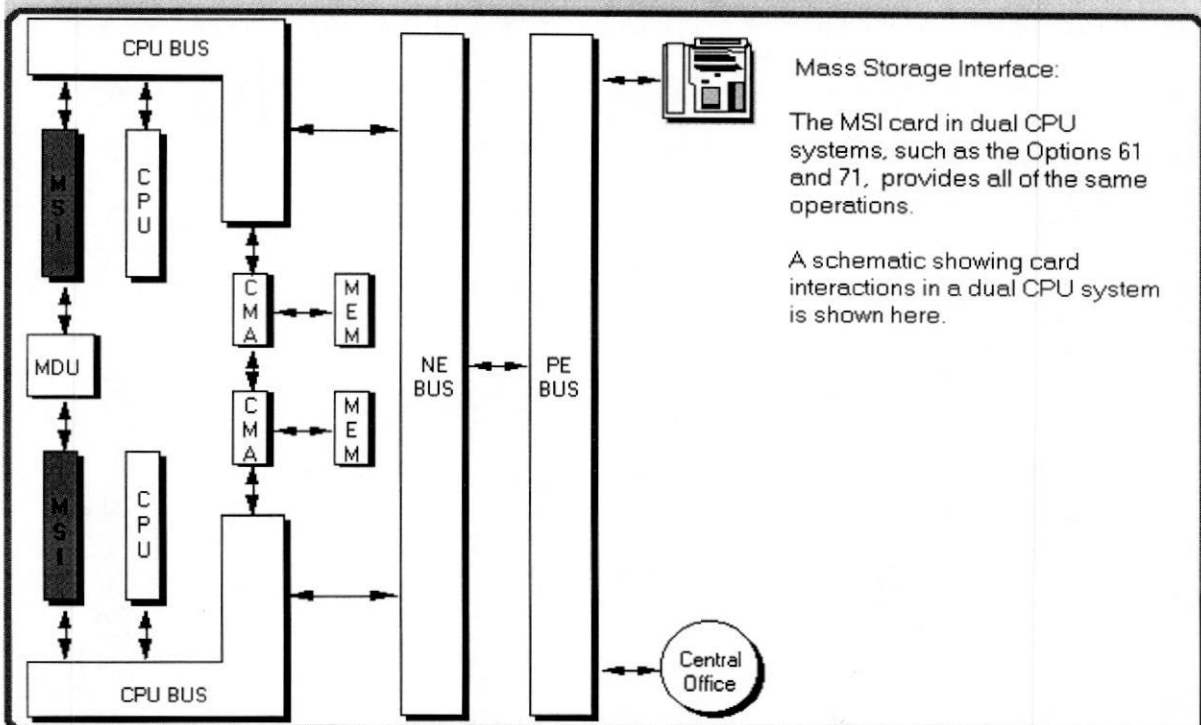
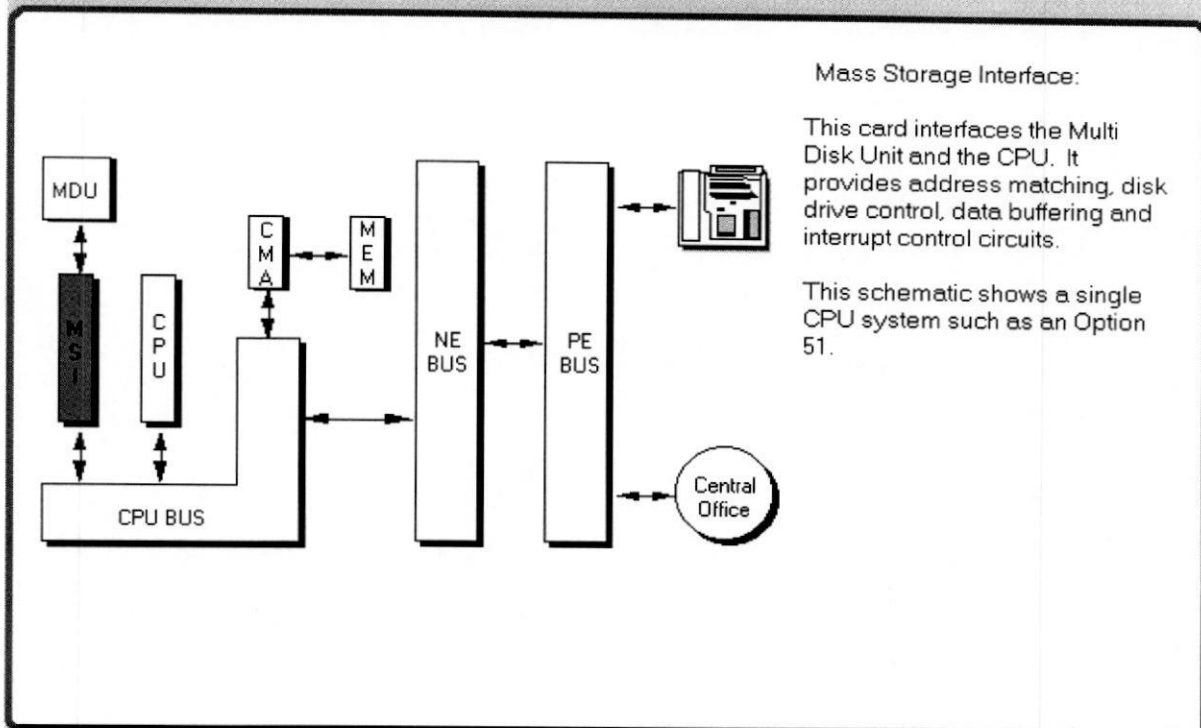
There are two types of Mass Storage Units available: a Floppy Disk Unit (FDU) or a Floppy Disk Unit with a Hard Drive, called a Multi-Disk Unit (MDU).

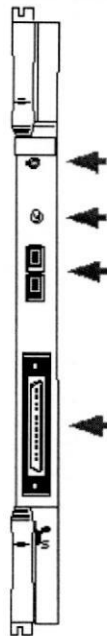
Options 21A, 21 and 21E are equipped with an FDU. The Option 51, 61 and 71 with X11 software release 18 and later require the MDU.



CPU/Network Module (CNE):

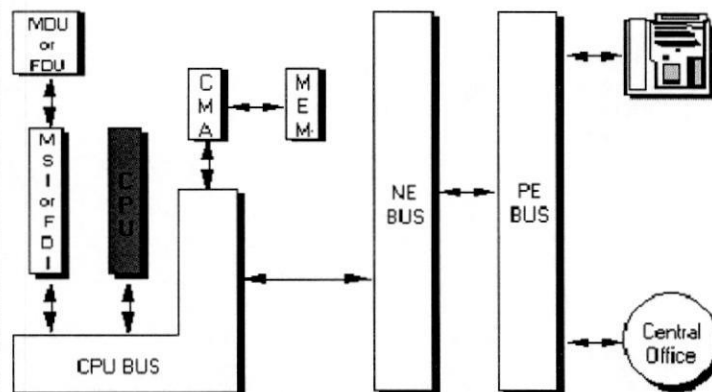
The CNE module provides the CPU control and network switching functions in the Options 51 and 61. The first 8 slots of the CNE module are used to house Network equipment. Card slot 9 houses the Clock Controller card, slot 10 the Peripheral Signaling card and slot 11 the 3 Port Extender. They will be discussed in a lesson later in this chapter.





Faceplate features of the MSI are:

- Red LED: When lit this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Two Digit Maintenance display: Indicates the status of the Multi Disk Unit.
- One Cable Jack: Used to connect the MSI with the Multi Disk Unit.

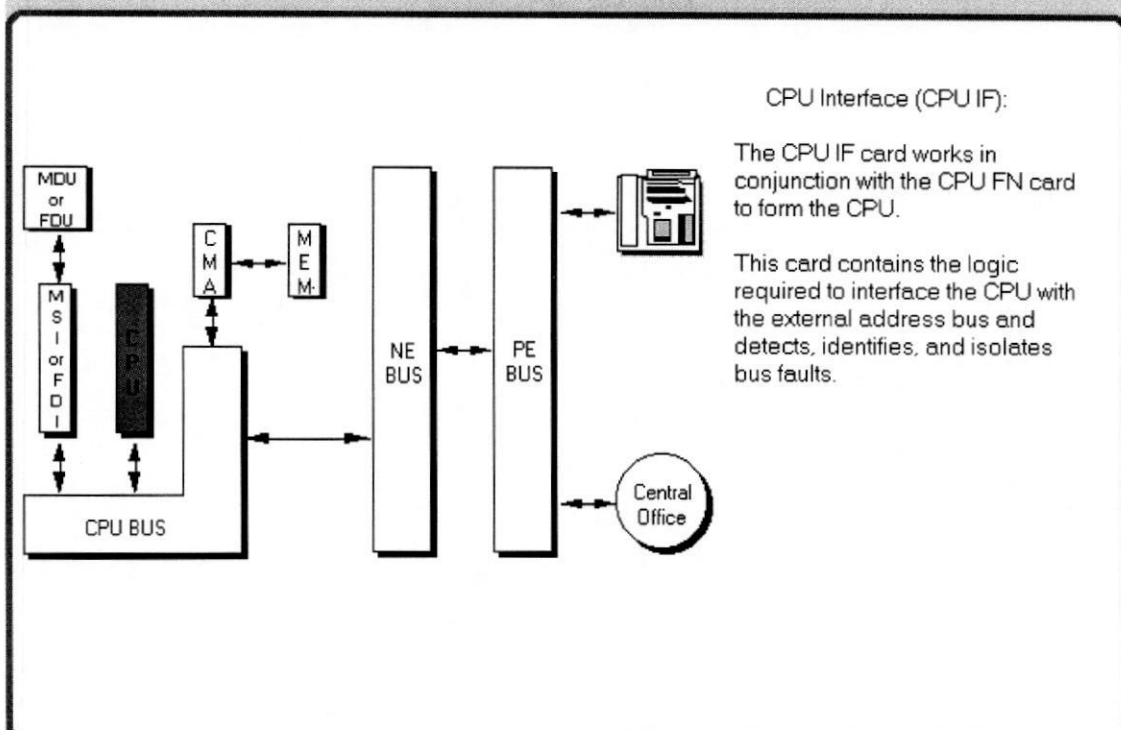
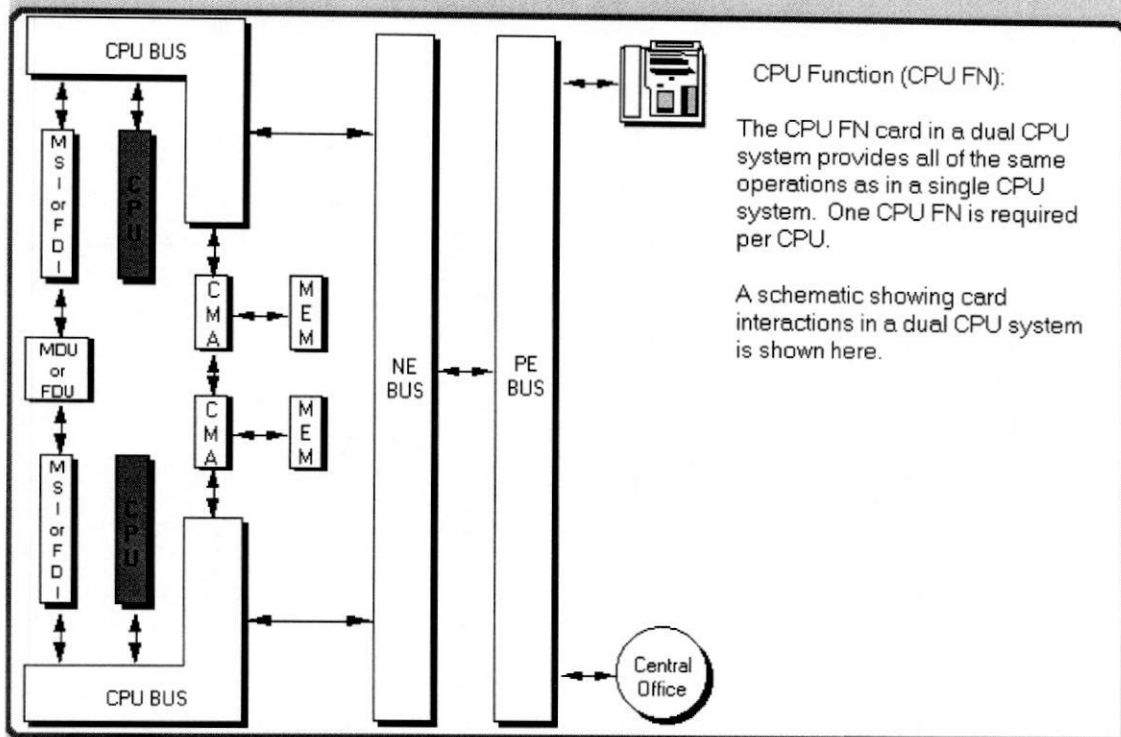


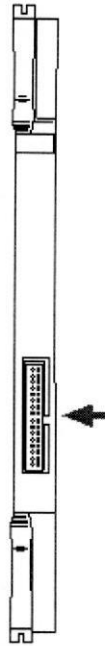
CPU Function (CPU FN):

The CPU FN card in conjunction with the CPU IF card, form the CPU.

The CPU contains the main circuitry for the CPU providing arithmetic/logical functions, instruction decoding and system code timing. A ROM daughter board mounts on this card.

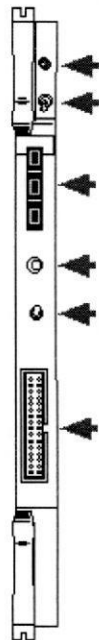
This schematic is of a single CPU system.





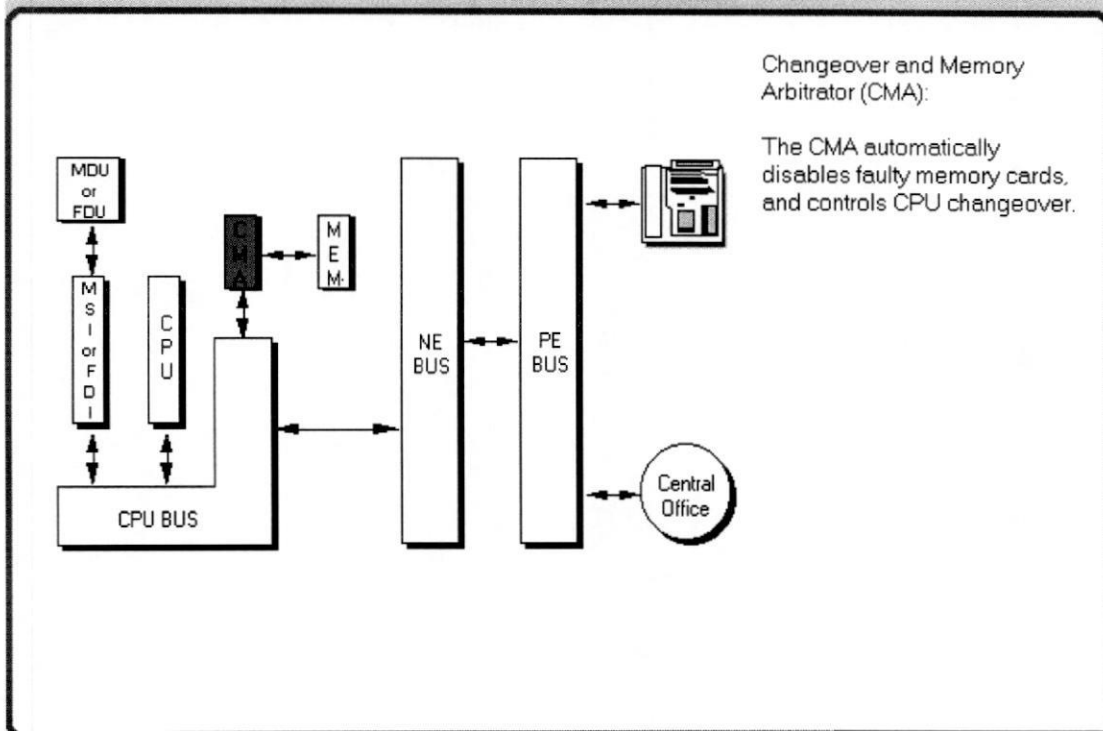
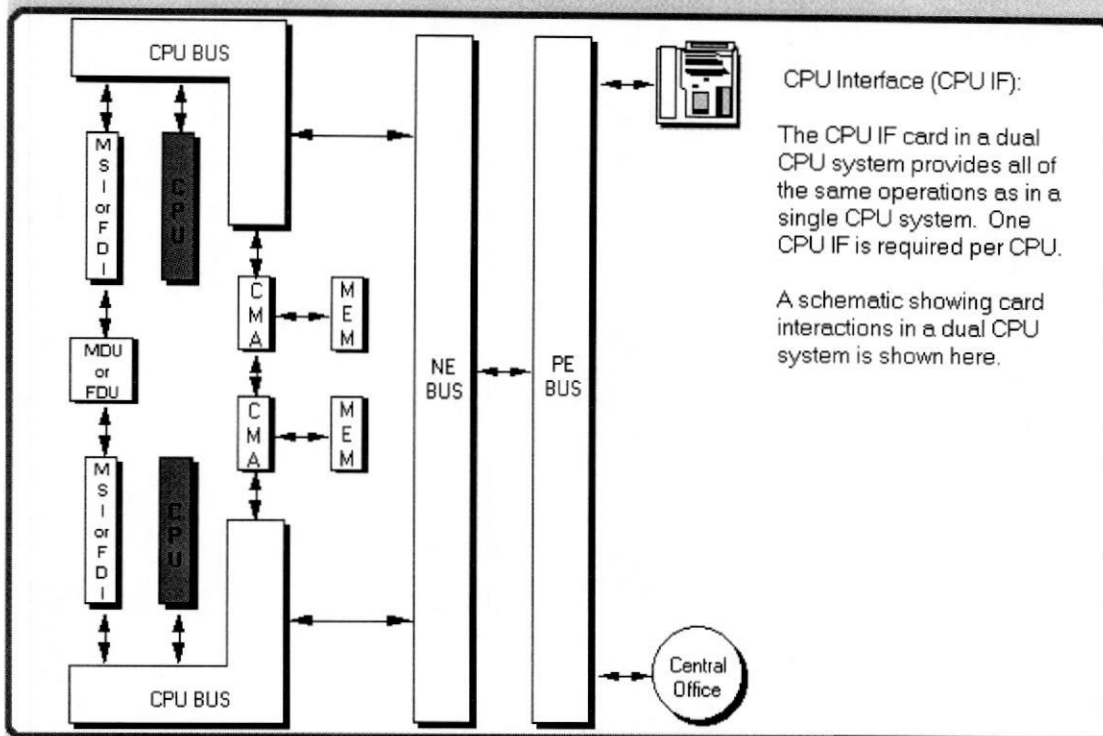
Faceplate features of the CPU FN card are:

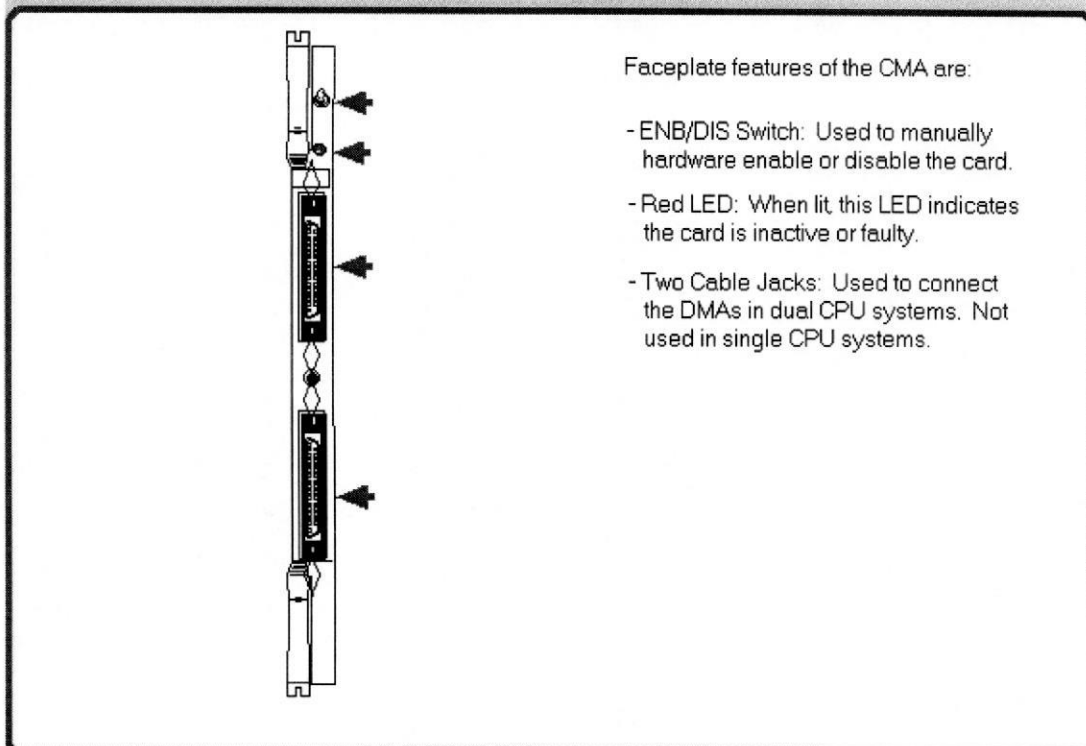
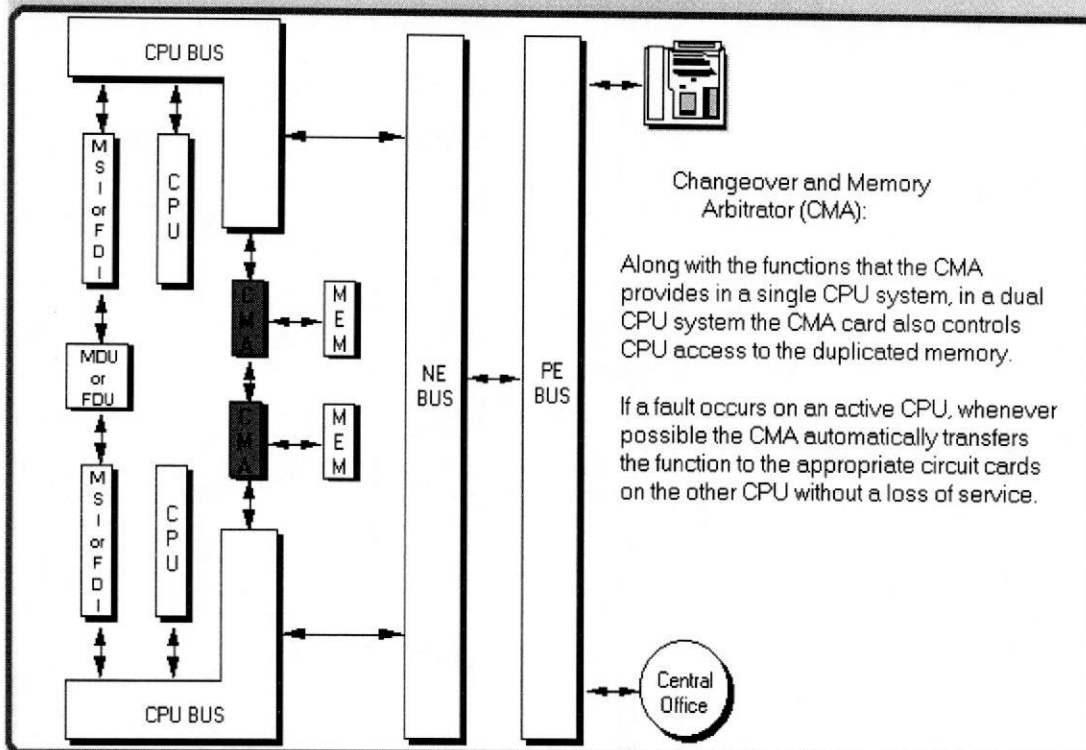
- One Cable Jack: Connects this card to the CPU IF card.

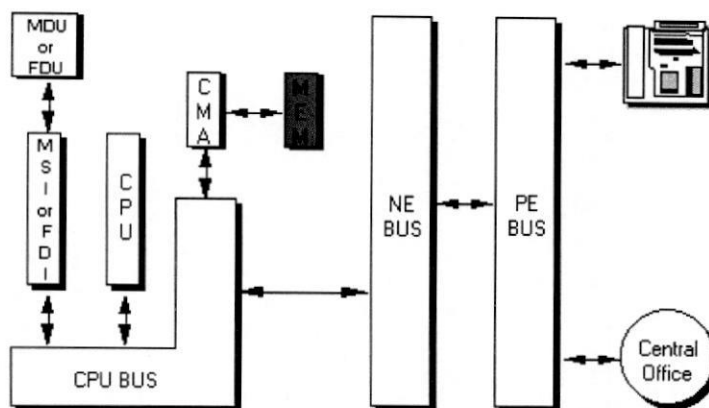


Faceplate features of the CPU IF are:

- Red LED: When lit, this LED indicates that the CPU is in Standby mode.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Three Digit Maintenance display: Indicates the Common Equipment faults.
- INI Button: Used to manually invoke the Initialize (INI) Routine.
- NORM/MAINT Switch: Used to prevent a CPU swap.
- One Cable Jack: Connects to the CPU FN card.

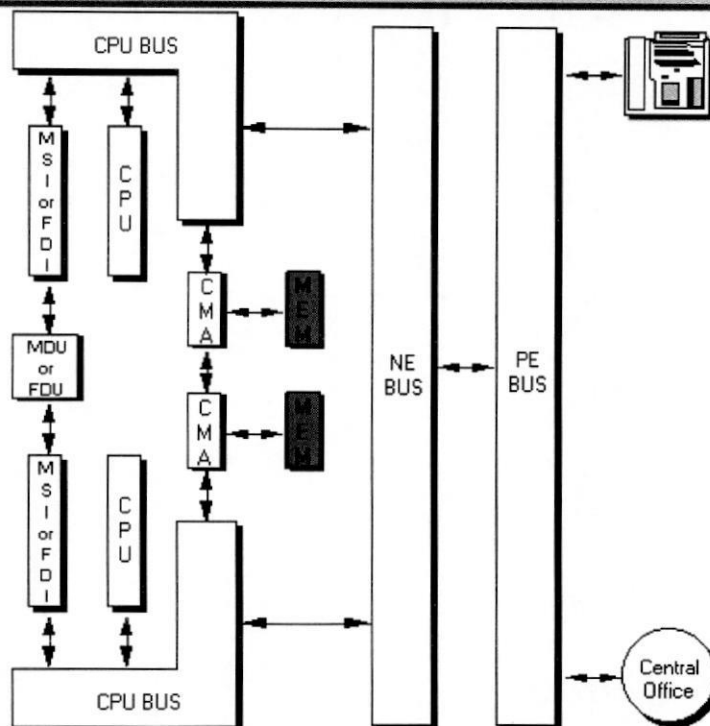






Memory (MEM):

With the X11 software release 18, a new 6Mbyte memory card increases memory capacity for the Options 51, 61 and 71.



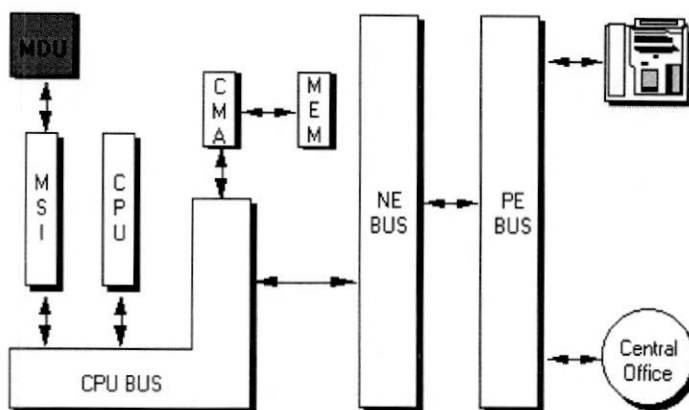
Memory (MEM):

Old 768K and new 6 MByte memory cards cannot be mixed. Only 2 cards of the same capacity can be configured in dual CPU systems.



Faceplate features of the MEM card are:

- Red LED: When lit, this LED indicates the card is inactive or faulty.

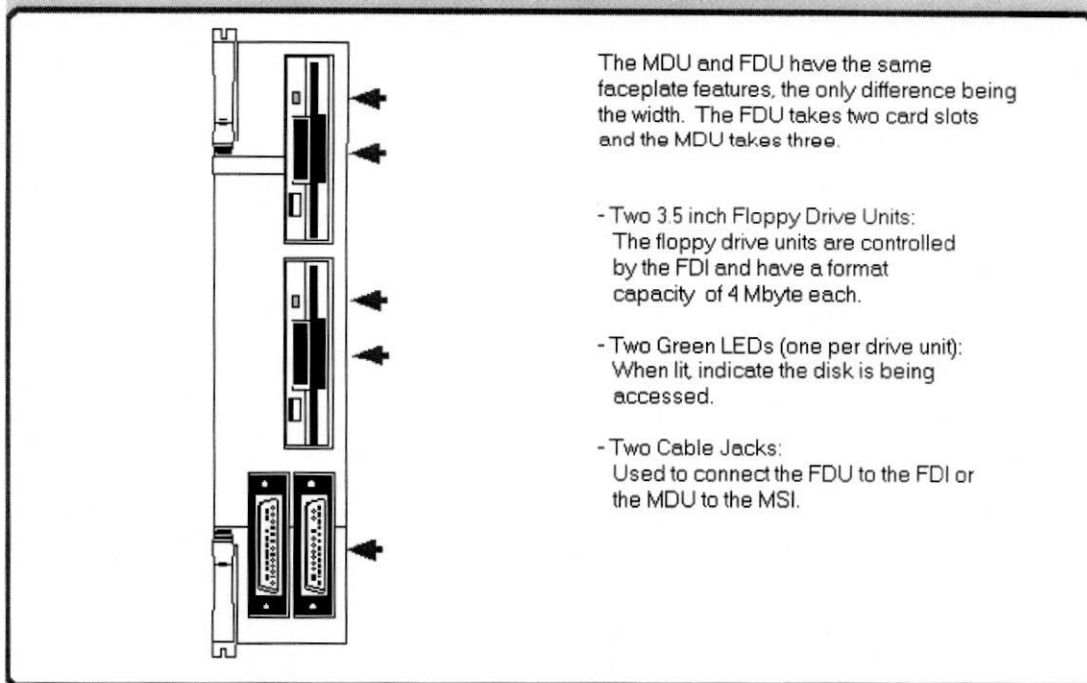
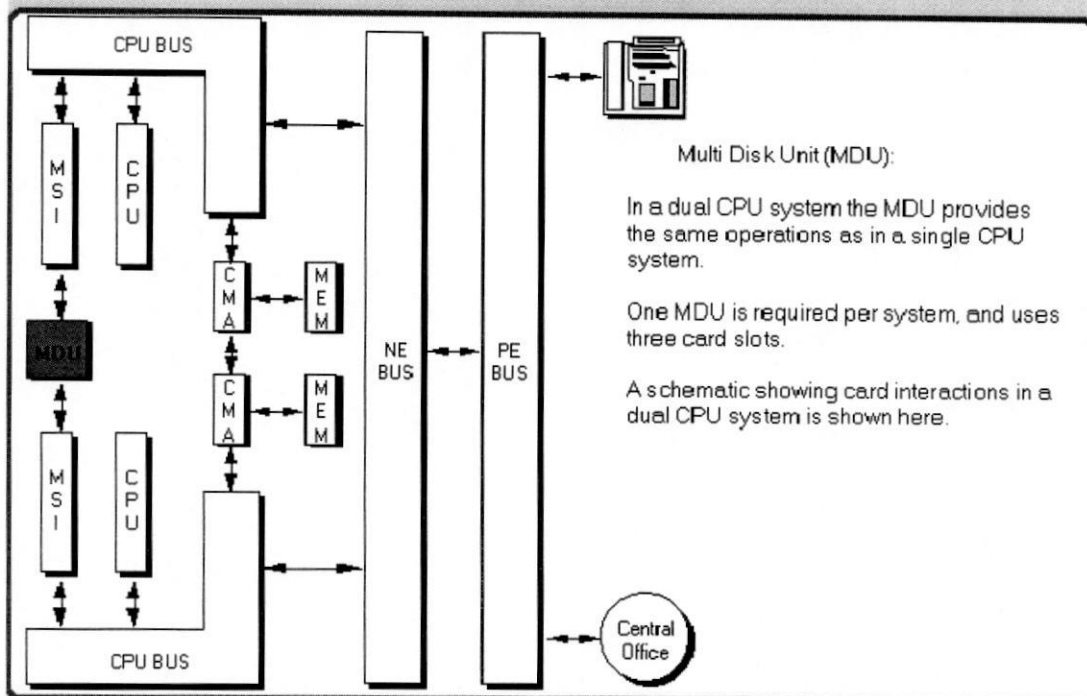


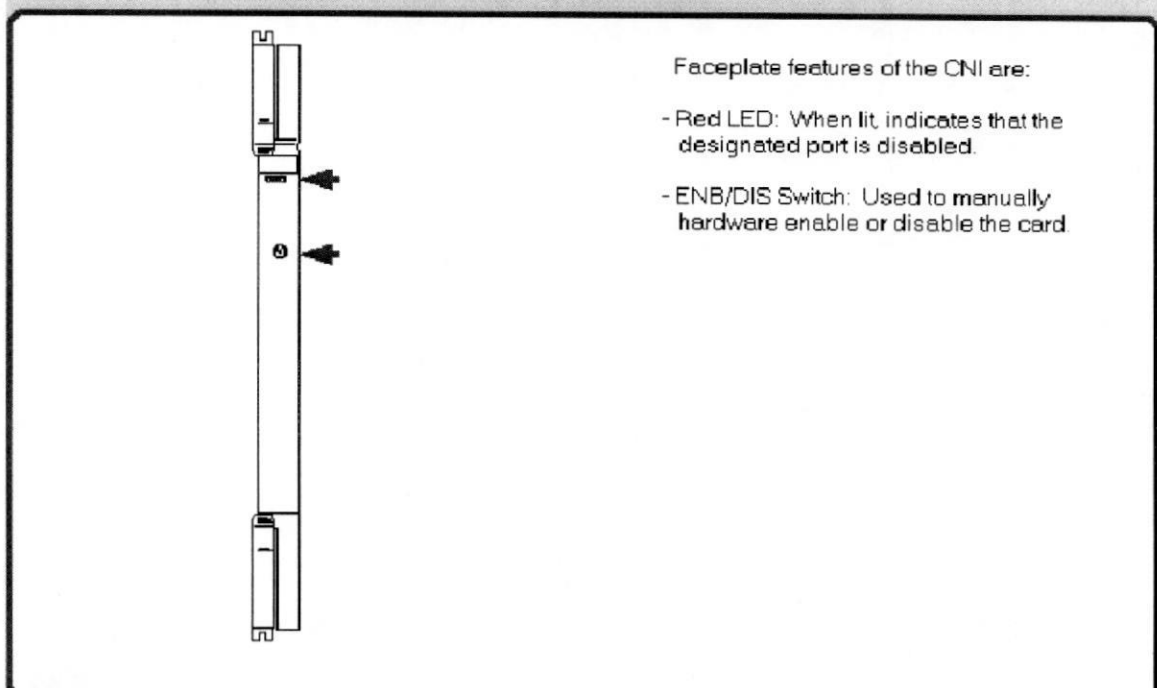
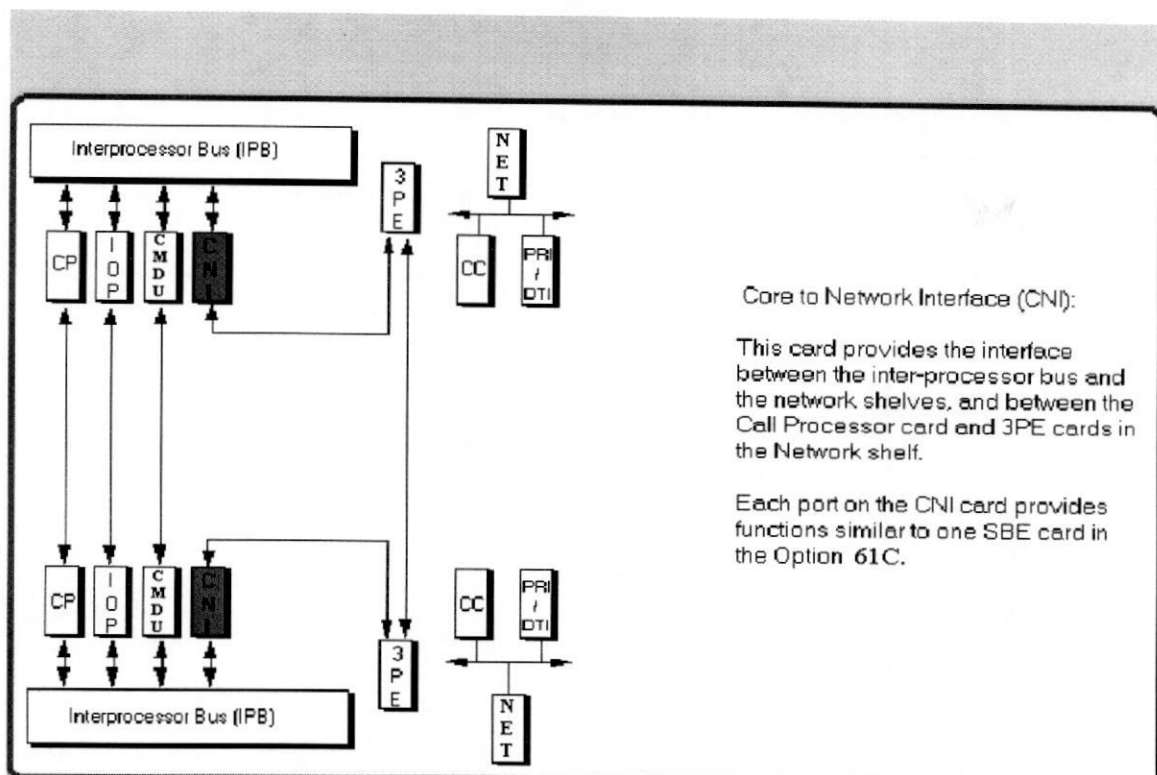
Multi Disk Unit (MDU):

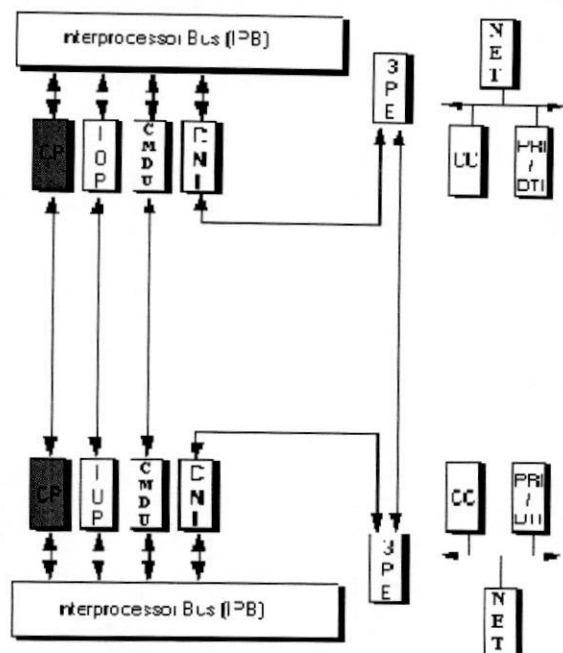
With the introduction of the X11 software release 18, the storage media for software required expansion.

The MDU is used to load programs and office data into system memory.

The MDU contains two 4 Mbyte floppy disk drives and a 120 Mbyte hard disk.



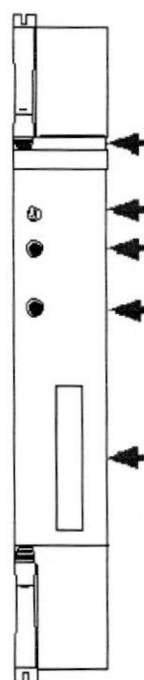




Call Processor (CP):

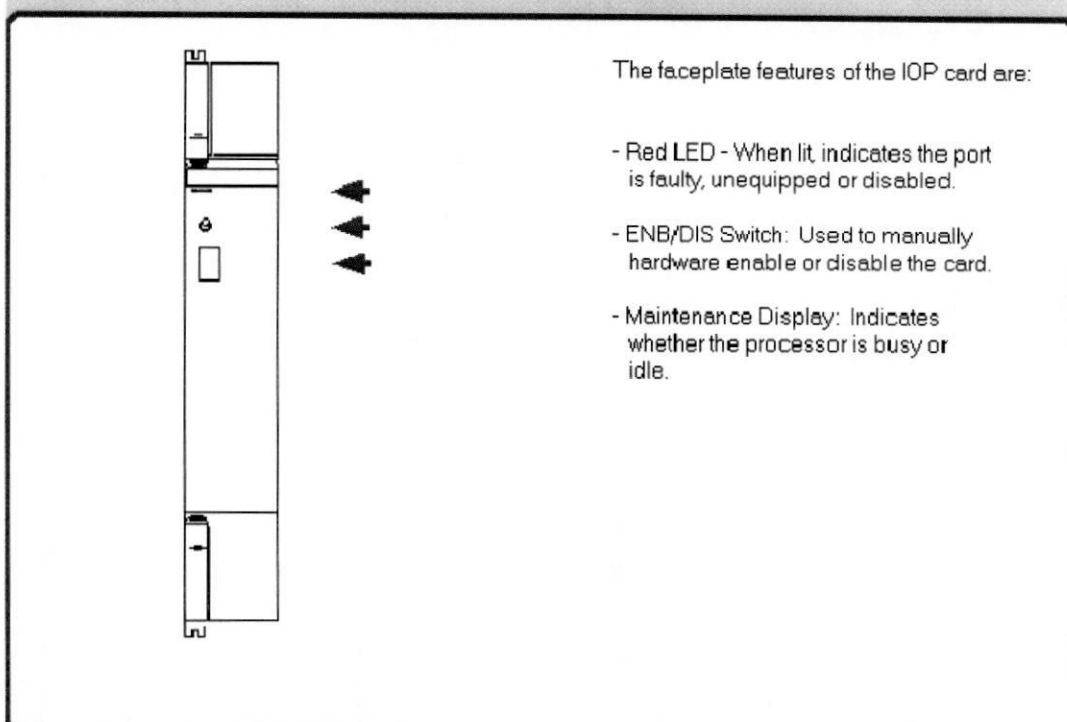
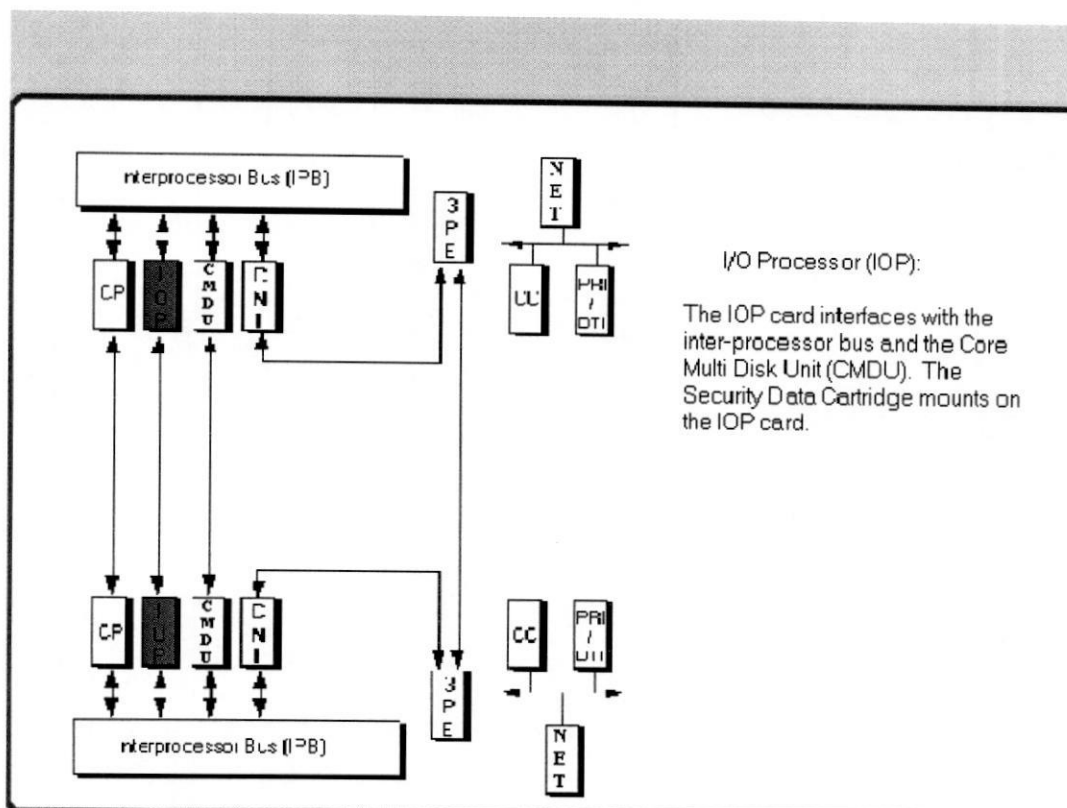
The CP card executes all call processing software, interfaces with the inter-processor bus, and provides on-board main memory and cache memory, system time of day clock/ calendar and a pair of serial data ports for maintenance.

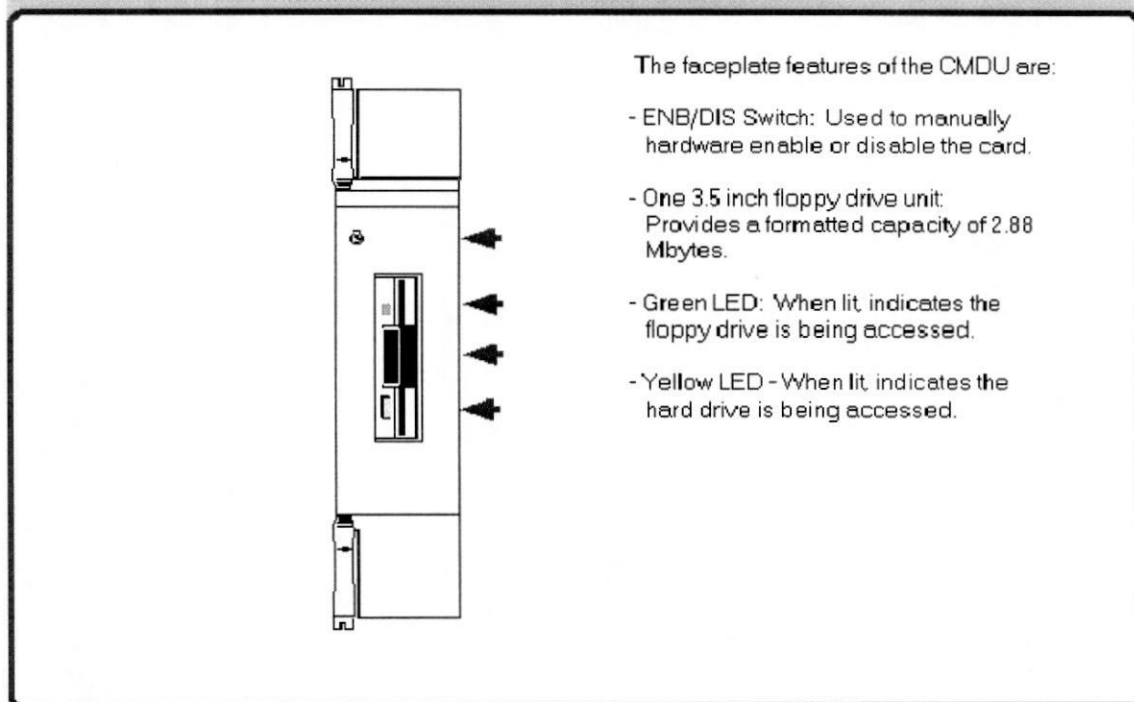
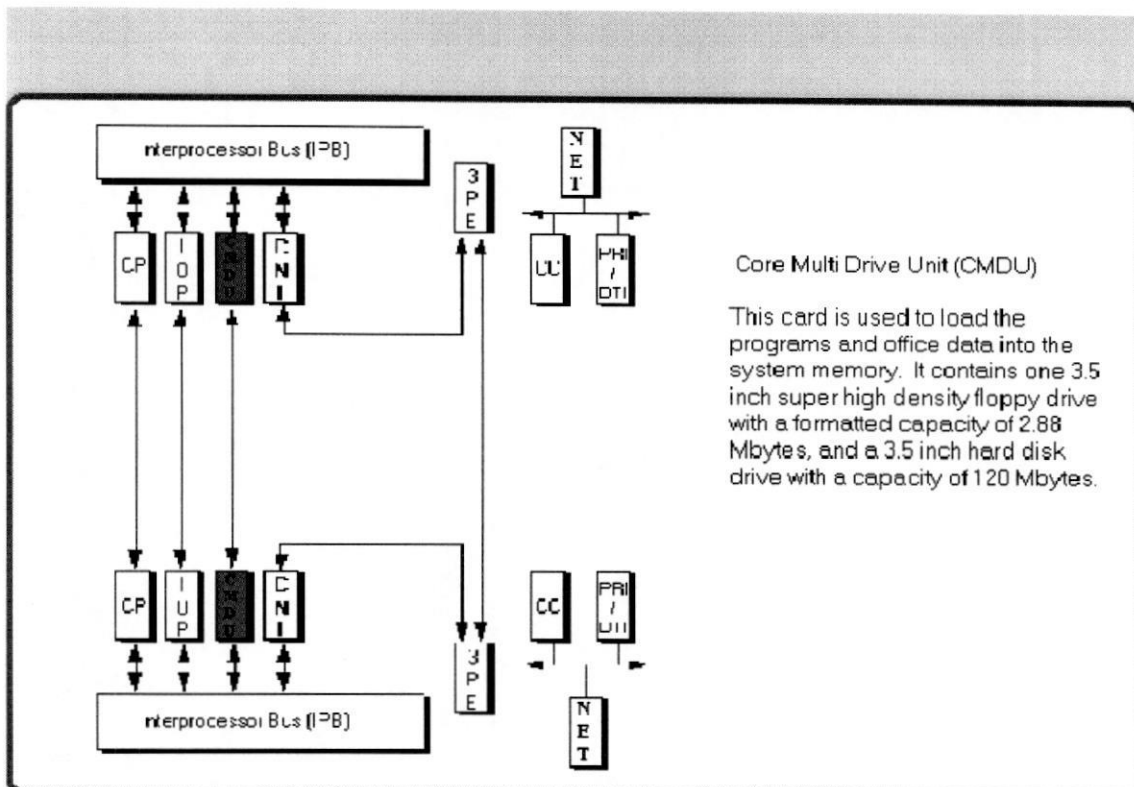
The CP card in the Option 61C provides similar functions to the CPU FN, CPU IF, CMA, Memory and ROM cards in Option 71.

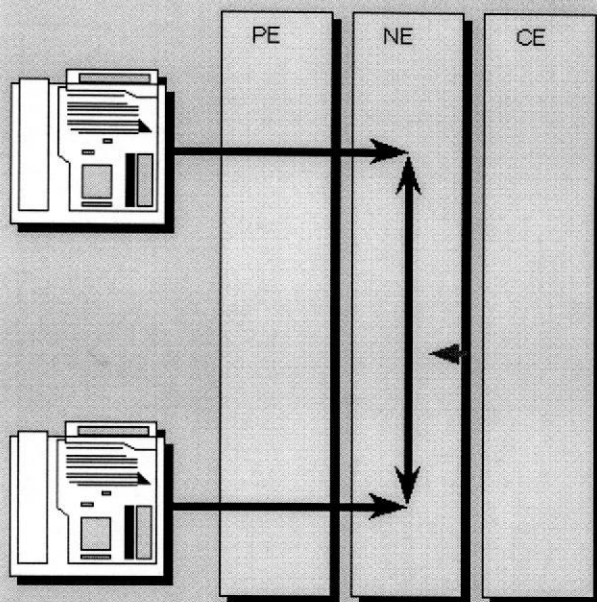


The faceplate features of the Call Processor card are:

- Red LED - When lit, indicates the port is disabled, faulty or unequipped.
- NORM/MAINT Switch - Used to prevent a CPU swap.
- Man INT Button - Used to manually invoke the Initialize (INI) Routine.
- Man RST - Used to manually invoke a complete reload of the system.
- 2 line LCD display - Displays fault messages.

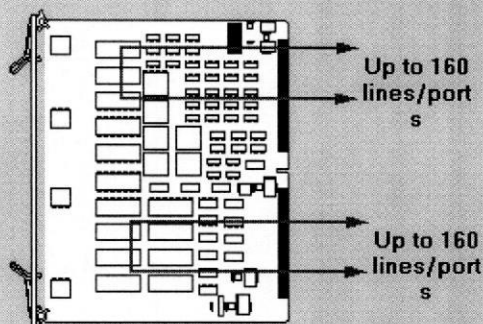






El equipo de red ejecuta la conmutación actual de información entre conexiones de teléfonos y de datos.

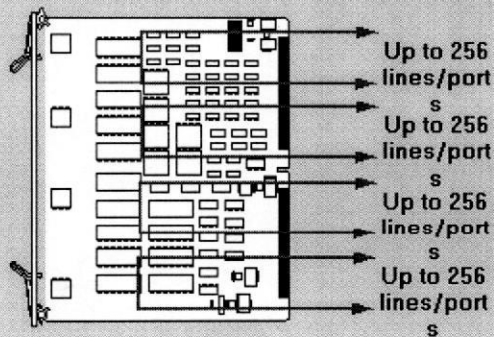
La conmutación es ejecutada bajo el control del CPU.

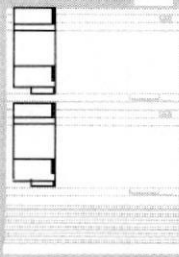


Las tarjetas de red pueden usar 2 ó 4 loops para formar una ruta de comunicación.

Hay 2 tipos de tarjetas las cuales proveen loops. Una tarjeta ENET (Enhanced Network) la cual provee 2 loops. Una tarjeta SNET (Superloop Network) la cual provee 4 loops.

Un loop soporta hasta 160 líneas/puertos por shelf. Un Superloop soporta hasta 512 líneas/puertos por shelf.

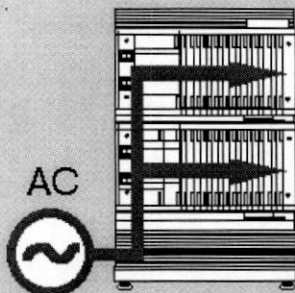
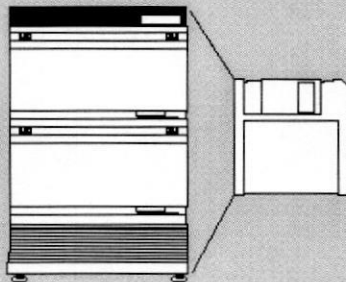




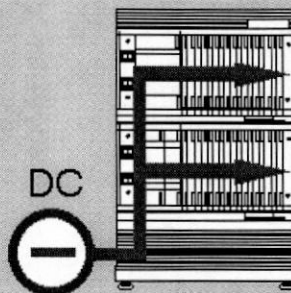
Power Equipment

Meridian 1 features a modular power distribution architecture. As part of the modular design, the Meridian 1 power system provides:

- power supplies located in each module, rather than in separate, centralized power shelves
- a universal quick connect power wiring harness which distributes input voltages and monitor signals to the power supplies each module
- modular backup capabilities, on a per column basis.



AC



DC

Although AC and DC internal power components differ, they function similarly. In the AC systems, AC power is input to the pedestal and distributed to each of the module's AC/DC power supplies. In the DC systems, DC power is input to the pedestal and distributed to each of the modules DC/DC power supplies.

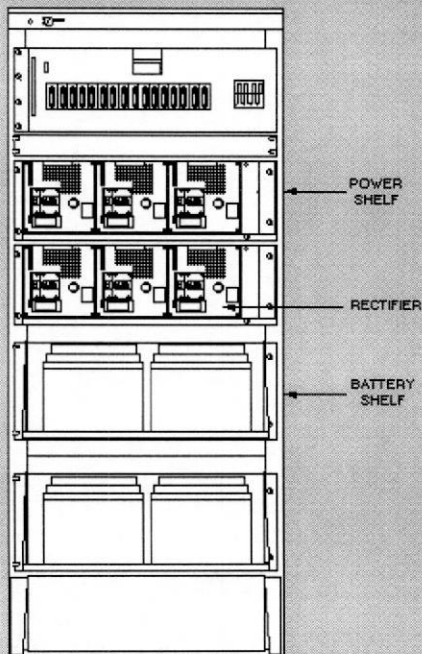
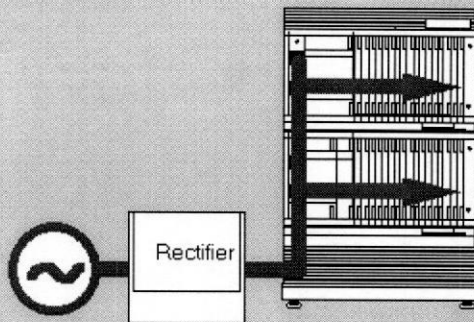
Except for the power components and the power wiring harness, all other functional elements within the system are the same for AC and DC systems.





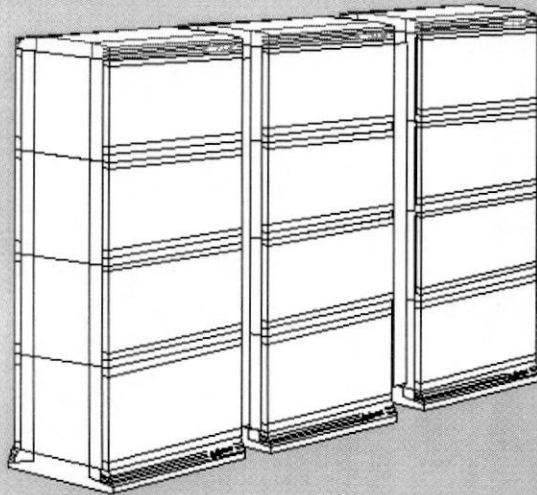
DC-Power

DC-powered systems require external rectifiers which plug into the commercial AC power source. DC powering requires a double conversion from the AC input voltage to the voltages required within the system. The rectifiers convert the AC voltage to -48V dc, which is distributed to the pedestal, then to the power supplies in the modules.



Batteries are generally used with DC-powered systems. The traditional telecommunications powering method is for the rectifiers to continuously charge a bank of batteries. However, batteries are only required if reserve power is needed.

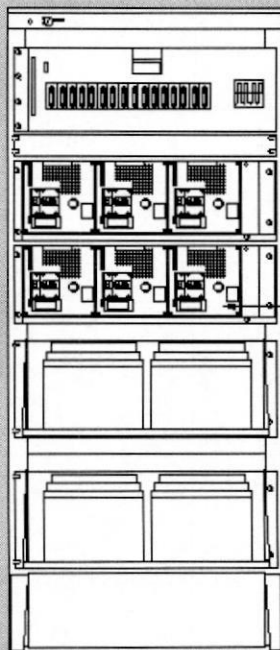




Option 71

DC systems can be configured as complete systems provided by Northern Telecom, or configured to connect to customer provided power plants. DC systems should be considered for:

- large systems
- systems with true long-term reserve power requirements
- when a customer has existing DC power plant or batteries available



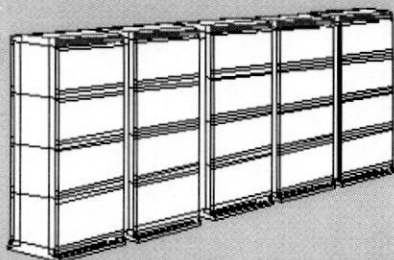
POWER SHELF

RECTIFIER

BATTERY SHELF

The DC powering scheme consists of an External Power Plant, Power Distribution Unit, Power Wiring Harness and DC Power Supply Converters.

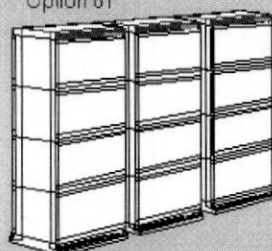
The External Power Plant consists of enclosed, rack mounted rectifiers. The rectifiers convert the 208 VAC line power into -48 VDC power for the system.



50 AMP
Rectifier

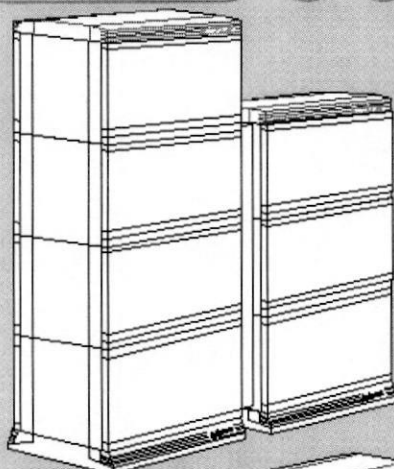
In system Options 71 and 81 the power plant uses 50 Amp rectifiers. The number of rectifiers needed is configuration dependent.

Option 81



50 AMP
Rectifier

Option 71

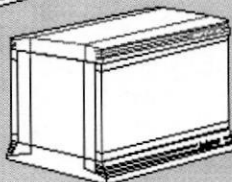


TEN

30 AMP
Rectifier

In system option 21, 21E, 51 and 61, the power plant uses 30 Amp rectifiers. The maximum number of 30 Amp rectifiers per system is six.

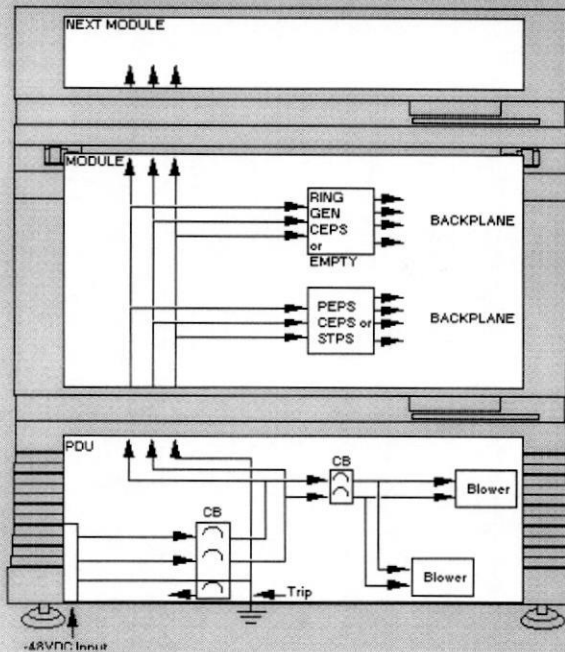
A 30 Amp rectifier can service two fully loaded modules. Thus, six rectifiers will service twelve modules.



ONE

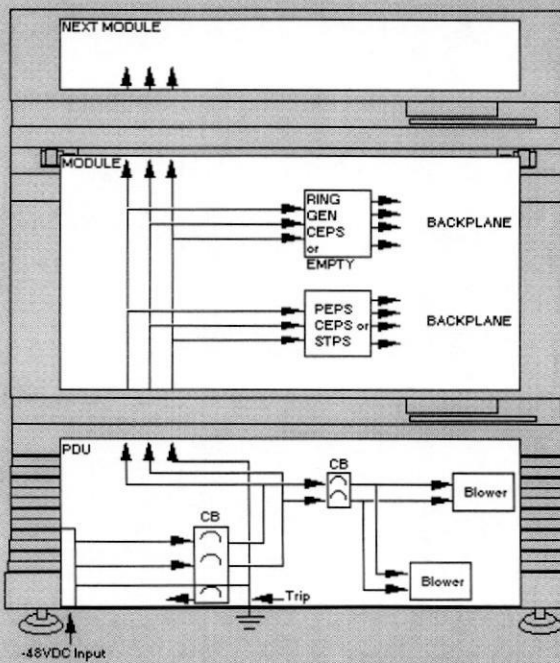
50 AMP
Rectifier

Option 21

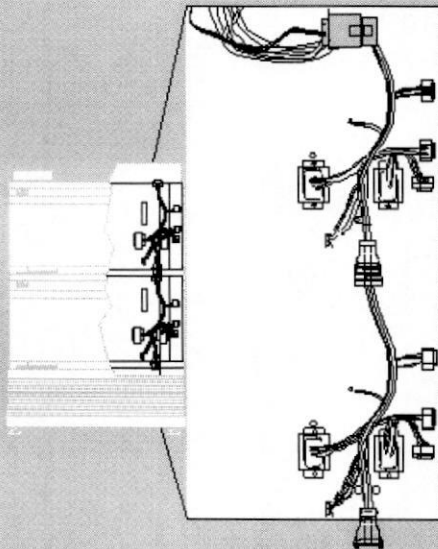


The Power Distribution Unit receives -48 VDC input at the terminal block located in the pedestal.

The -48 VDC is routed from the terminal block to five 2 pole circuit breakers. These provide surge protection for the entire column.

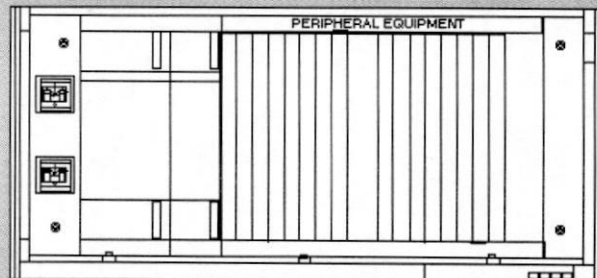


The power is routed from the circuit breaker to the individual module DC Power Supply Converters and to two forced air impellers (blowers).



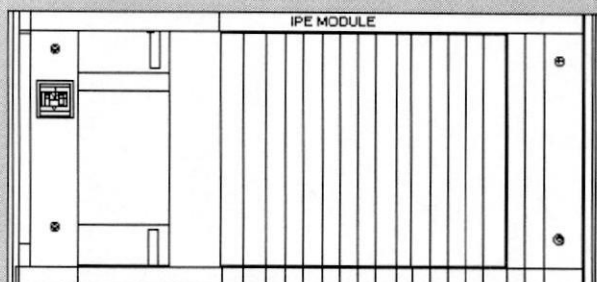
The Power Wiring Harness routes the -48 VDC from the pedestal to the modules on a power wiring harness.

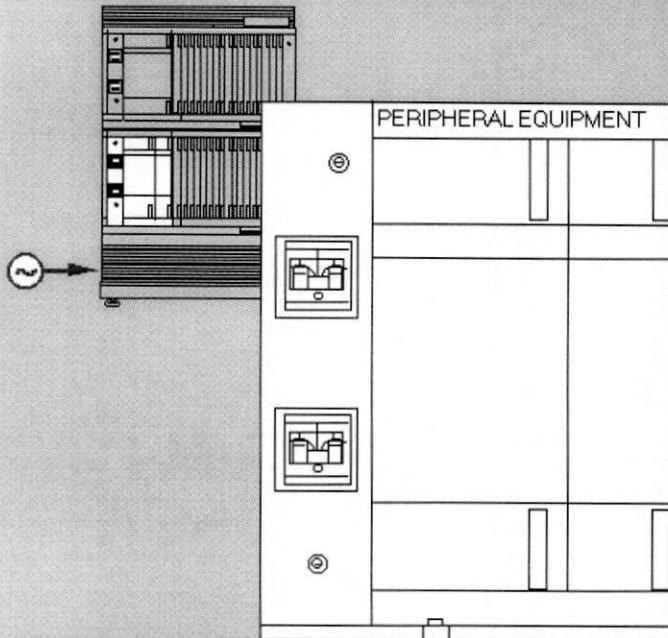
This harness uses quick disconnect plugs that are attached to both the top and bottom of each module, as well as the module power supply. The connections are made via the backplane.



DC power supply converters convert -48 VDC into the required voltages for circuit cards receiving their power from the backplane. All DC Power Supplies are located to the left of the module, the same as AC Power Supplies. They are:

- CE Power Supply
- PE Power Supply
- CE/PE Power Supply
- DCRG Power Supply

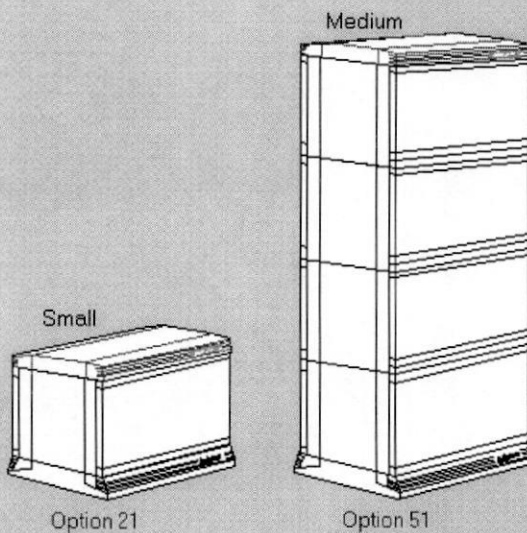




AC-Power

AC powered systems require no external power components and can plug directly into the commercial AC power source.

AC powering requires a single conversion from the AC input voltage to the voltage required within the system. This conversion is performed by power supplies in the modules that convert AC voltage to the DC voltage required to power the cards in the modules.



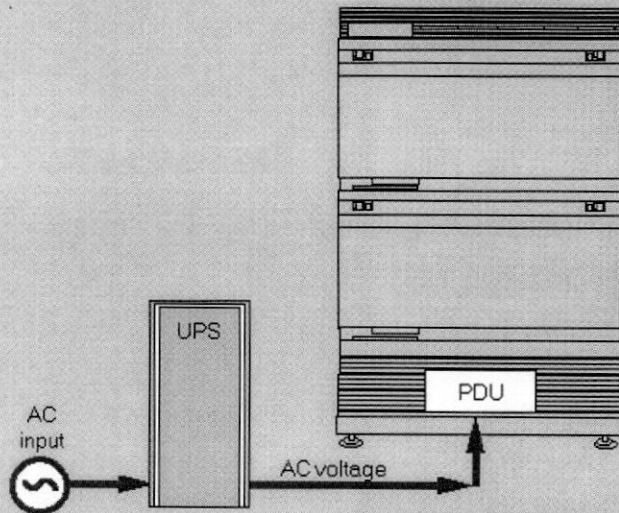
AC powered systems are well suited for applications that do not require reserve power.

They are also recommended for small to medium sized systems that require reserve power with back-up times ranging from 15 minutes to 8 hours.



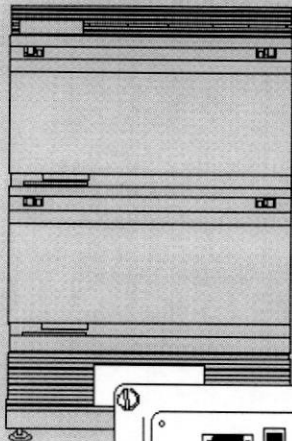


Meridian 1 (rear view)

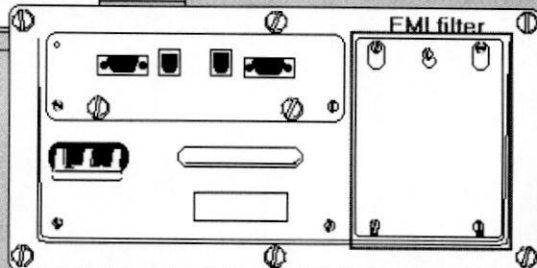


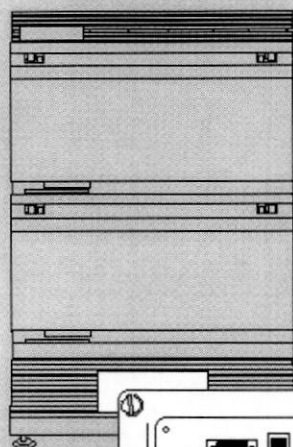
If reserve power is required with an AC-powered system, an Uninterruptible Power Supply (UPS) is installed in series with the AC power source.

AC-powered systems that do not require long term back-up can benefit from a UPS with short-term backup because the UPS typically provides power conditioning during normal operation, as well as protection against sags, brownouts, and other low-voltage transient conditions that cause most power disturbances.

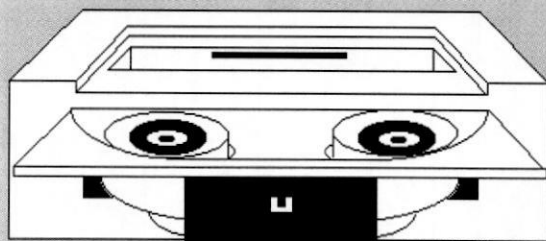
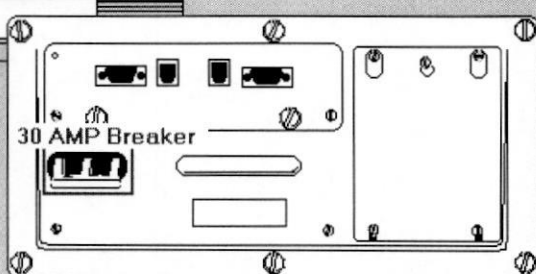


The AC-powering scheme consists of a Power Distribution Unit which is located in the pedestal. The 208 to 240 VAC input power enters the PDU and is routed through an Electromagnetic Interference (EMI) filter.

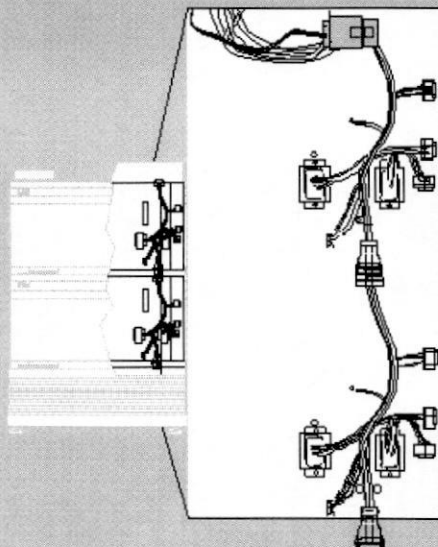




The EMI filter 'cleans-up' the AC power and sends it to a 30 amp circuit breaker. This breaker provides surge protection for the entire column.



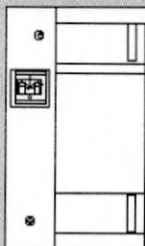
From the circuit breaker, the power is routed to the individual module power supplies and two forced air impellers (blowers). These are located in the pedestal. The forced air impellers provide the cooling for the column.



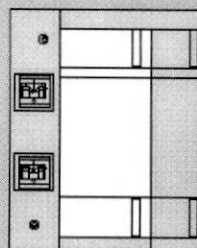
The Power Wiring Harness routes AC power from the pedestal to the modules. This harness uses quick disconnect plugs that are attached to both the top and bottom of each module as well as the module power supply. These connections are made via the backplane.



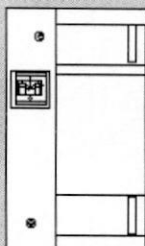
CE



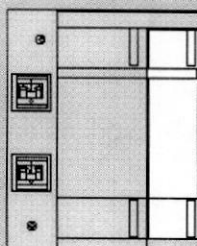
PE



CE/PE



ACRG

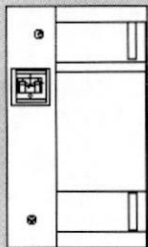


There are four kinds of power supplies that can be used in the Meridian 1.

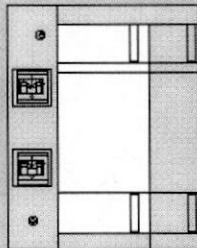
The number and kind is determined by the type of backplane used in the module.



CE



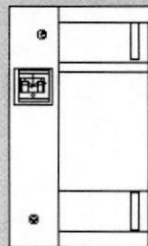
PE



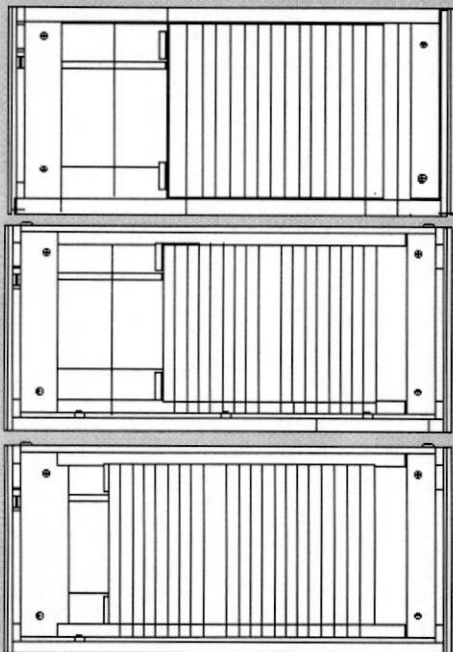
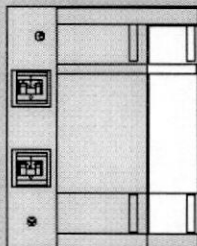
All power supplies are protected by a circuit breaker located on the left side of the module. If more than one power supply is installed, the top breaker protects the left most power supply and the bottom breaker protects the power supply on the right. A green LED indicates the power supply is operational.

Select a power supply for more information, or the forward arrow to learn about DC power.

CE/PE



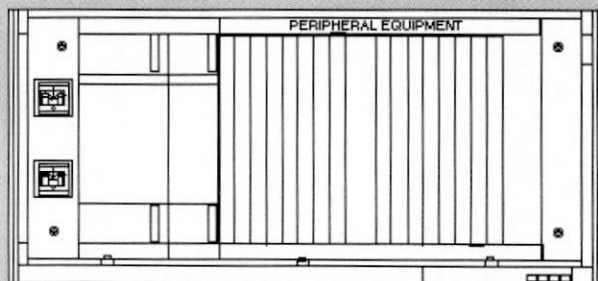
ACRG



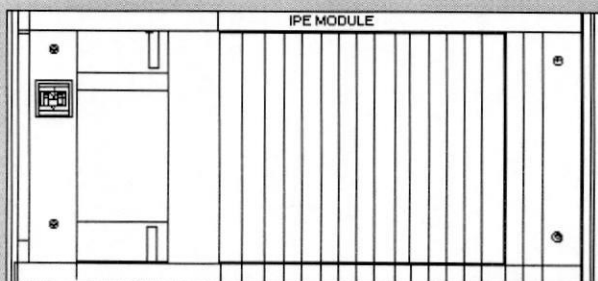
The Common Equipment Power Supply is used in the CPU Module, the Network Module, and the CPU/Network Module. It is installed in the slot labeled CE Pwr Sup on the left side of the module.

The +5 and +/- 12 VDC logic is provided to the Common Equipment and Network modules circuit cards via the backplane.





The Peripheral Equipment Power Supply is used in the Intelligent Peripheral Equipment Module and the Peripheral Equipment Module. It is installed in the slot labeled PE Pwr Sup on the left side of the module.



Digital Set
+5 and +8.5 VDC logic

Analog Set
+/- 10 VDC signaling



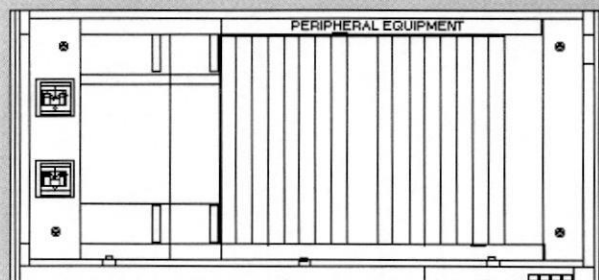
Multi-line Set
+/- 15 VDC signaling

500/2500 Set
-48 VDC talk battery
-150 VDC MW lamp voltage



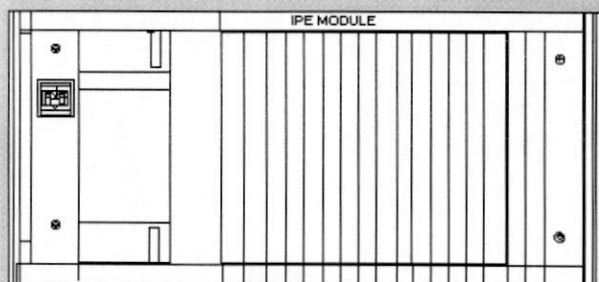
Peripheral Equipment Power Supplies produce +5 and +8.5 VDC logic for digital telephones, +/- 15 VDC signaling voltage for multi-line telephones and -48 VDC talk battery and -150 VDC message waiting lamp voltage for 500/2500 telephones.





The CE/PE Power Supply is used in Common/Peripheral Equipment Modules and local and remote site Remote Peripheral Equipment (RPE) modules. It is installed in the slot labeled CE/PE Pwr Sup on the left side of the module.

The CE/PE Power Supply uses 208 VAC input power.



CE & NE Circuits
+5 and +/- 12 VDC logic

Digital Set
+8.5 VDC signaling



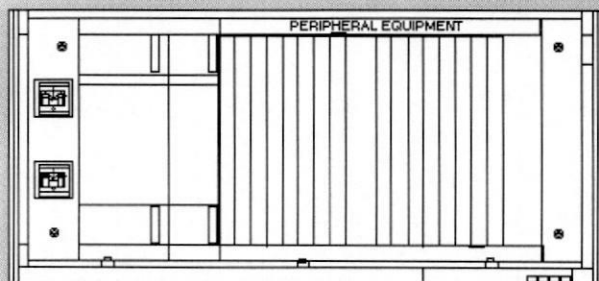
Multi-line Set
+/- 15 VDC signaling

500/2500 Set
-48 VDC talk battery
-150 VDC MW lamp voltage

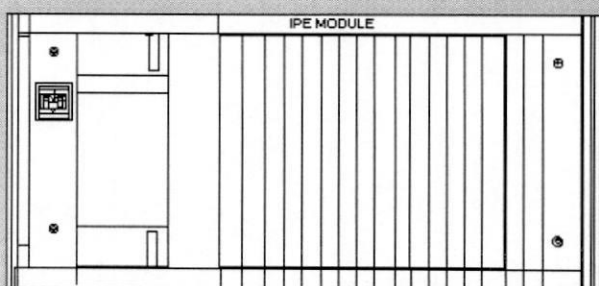


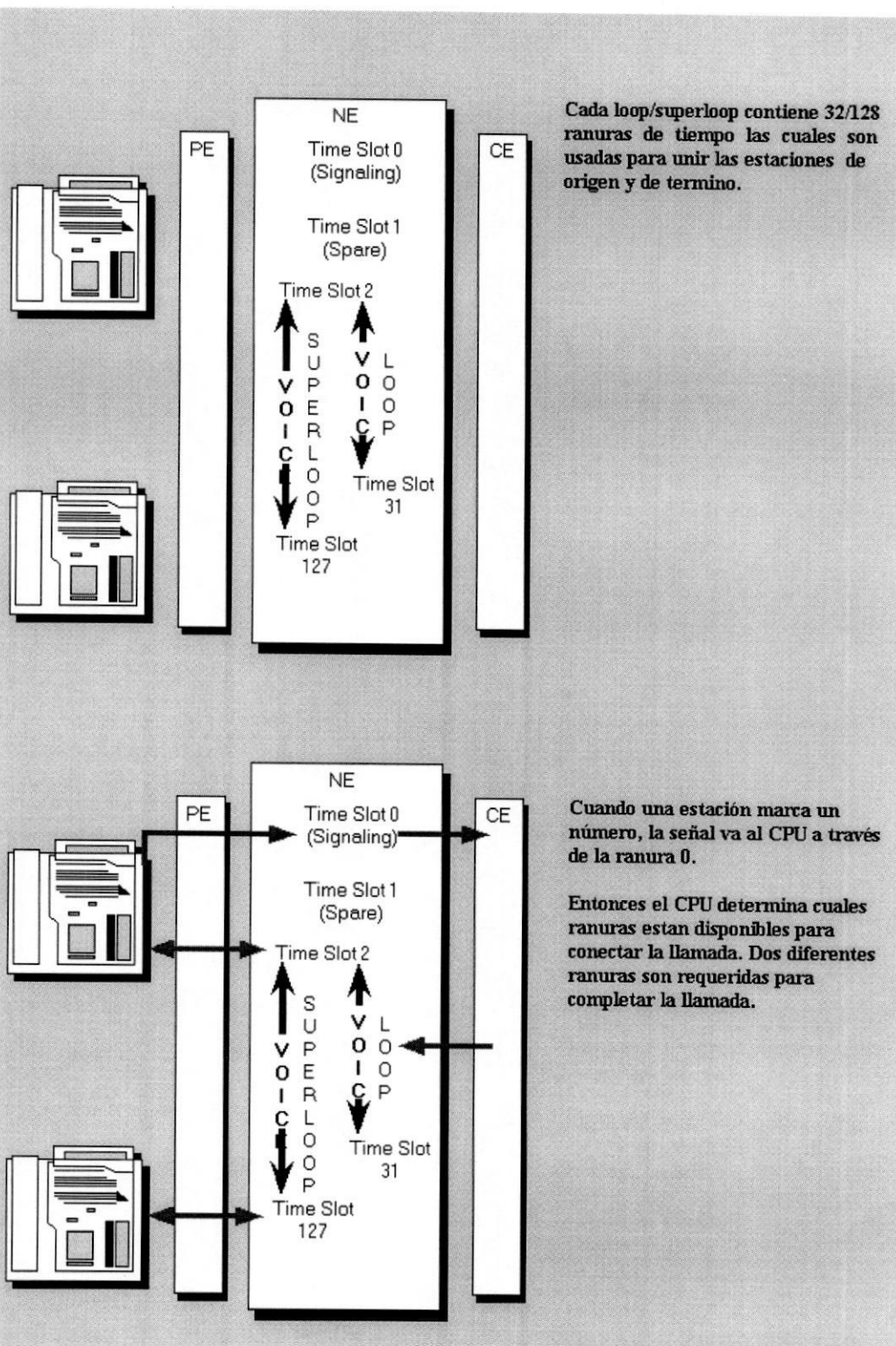
The CE/PE Power Supply produces +5 and +/- 12 VDC logic for CE and NE circuits, +8.5 VDC signaling voltages for multi-line sets and -48 VDC talk battery and -150 VDC message waiting lamp voltages for 500/2500 telephones.

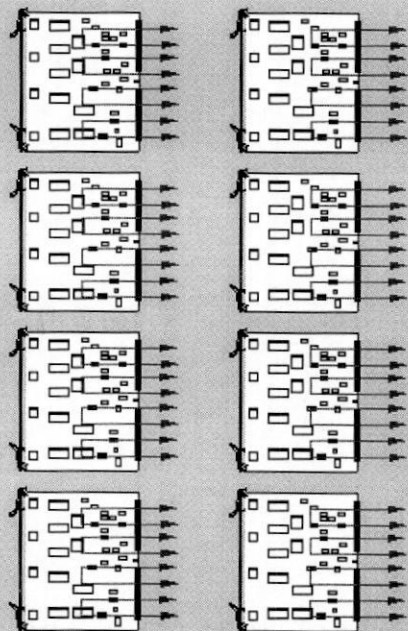




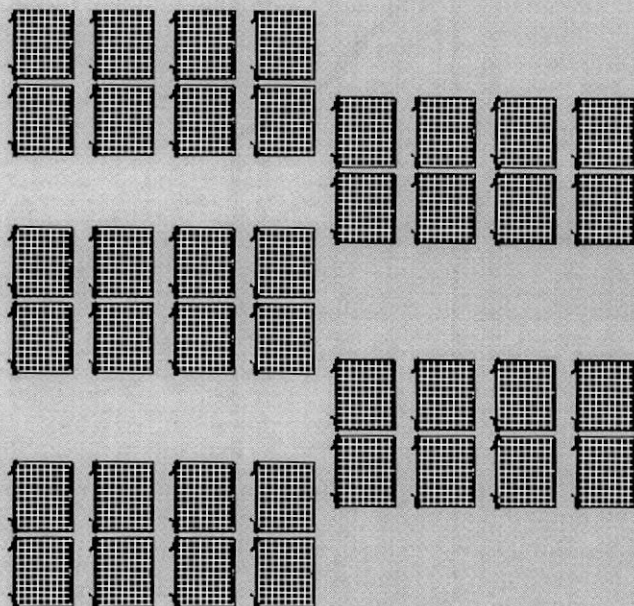
AC Ringing Generators (ACRG) are used in Intelligent Peripheral Equipment modules or Peripheral Equipment Modules. They are installed in the slot labeled Rng Gen on the left side of the module. The Ringing Generators provide 70, 80, 86 VAC at 20, 25 50 Hz used to ring 500/2500 telephones.



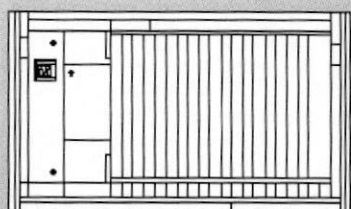




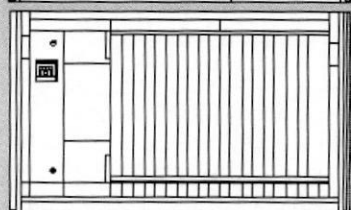
32 loops forman un grupo de red



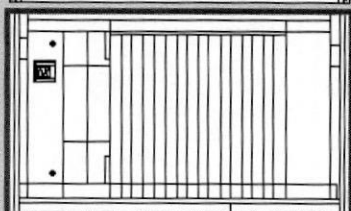
El máximo número de grupos que un sistema puede tener es cinco, numerados del 0 al 4.



COMMON /
PERIPHERAL
EQUIPMENT

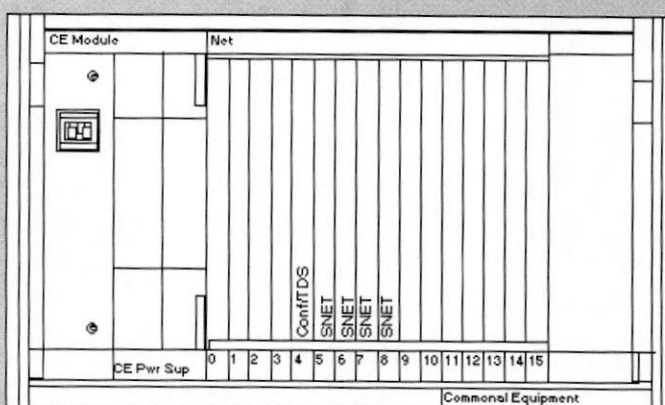


CPU/NETWORK



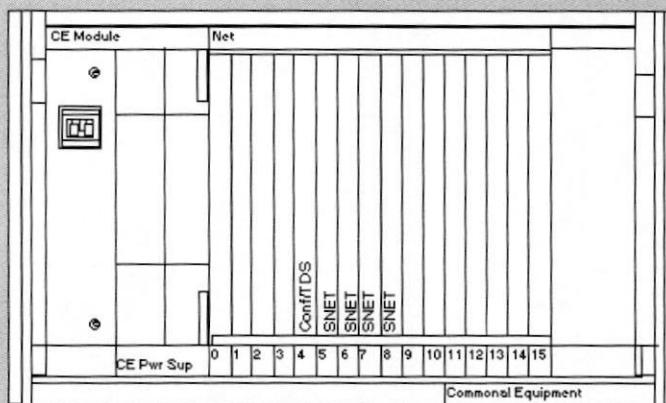
NETWORK
K

La localización en la cual estas tarjetas de circuitos son colocadas varia de acuerdo al tipo de modulo de red que sea usado.



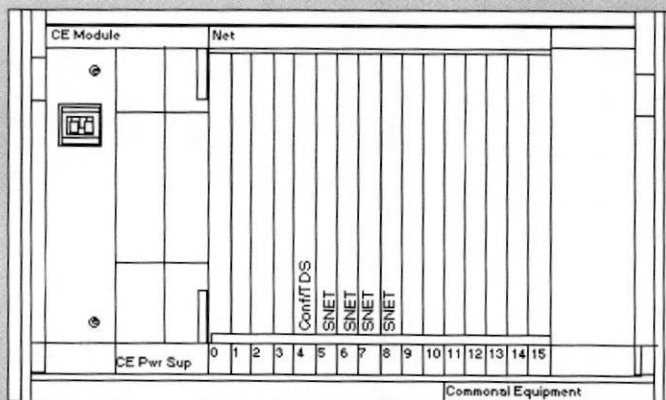
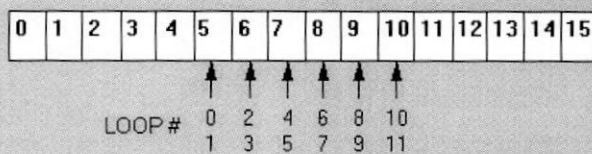
Para el modulo de red de la figura las tarjetas ENETs pueden ser ubicadas desde las ranuras 5 a la 12.

Una configuración común es ENETs desde las ranuras 5 al 10, con la ranura 11 para Conf/TDS, y una ranura disponible.

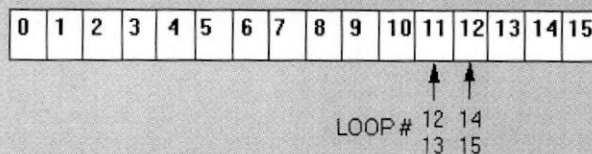


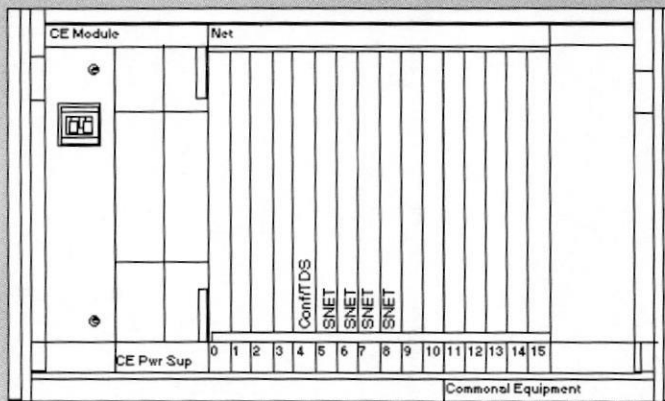
La tarjeta ENET en la ranura 5 direcciona los loops de red 0 y 1. La tarjeta en la ranura 6 direcciona los loops 2 y 3.

Esta numeración continua hasta la última tarjeta en la ranura 10, la cual direcciona los loops 10 y 11.



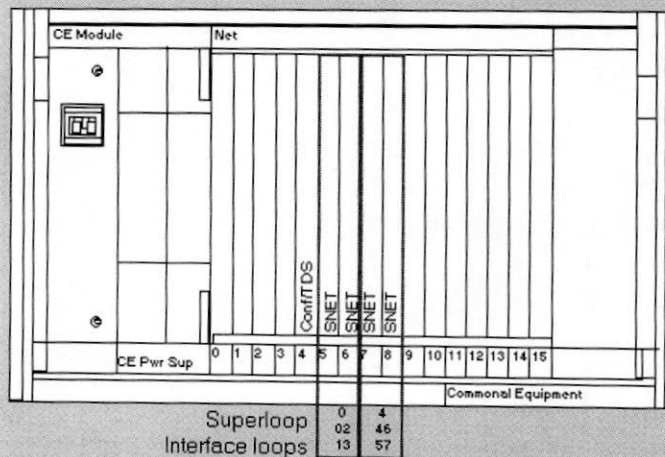
La tarjeta de Conf/TDS es usada en la ranura 11. El TDS usa el loop 12 y la Conf en el loop 13. Esta configuración deja libre la ranura 12 para otra tarjeta Conf/TDS o ENET, la cual usaria los loops 14 y 15.





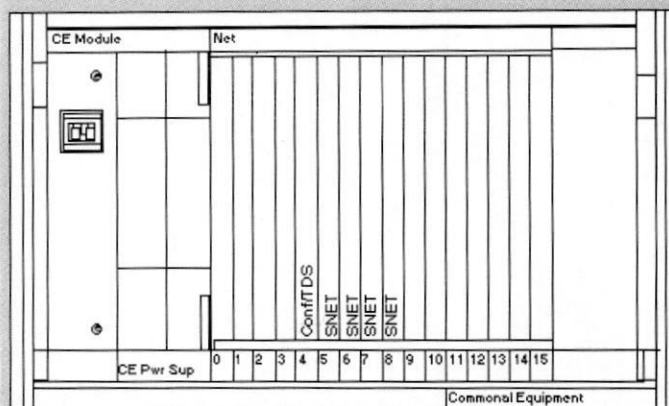
Como se mencionó anteriormente, cada SNET ocupa 4 loops. Es decir que se requiere unicamente 4 SNETs para dar servicio a los 16 loops.

También pueden alojarse en las ranuras tarjetas que no ocupan loops de red, tales como SDIs o DTIs.



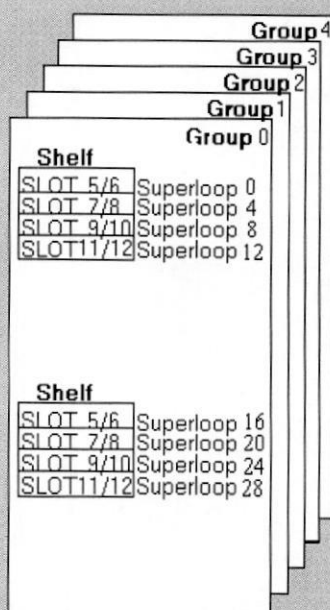
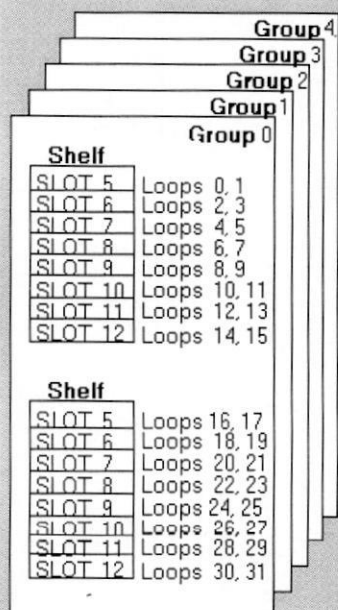
Para direccionar los loops 0,1,2 y 3, la tarjeta SNET debe ser colocada en la ranura 5 o 6. Esto forma el Superloop 0.

Para direccionar los loops 4,5,6 y 7, la tarjeta SNET debe ser colocada en la ranura 7 o 8. Esto forma el Superloop 4.



Esta forma de colocación y numeración del sistema con la SNET en la ranura 11 o 12 usando los loops 12,13,14 y 15
 Esto forma el superloop 12.

Las ranuras vacantes por la tarjeta SNET pueden ser usadas por alguna tarjeta que no sea de red.

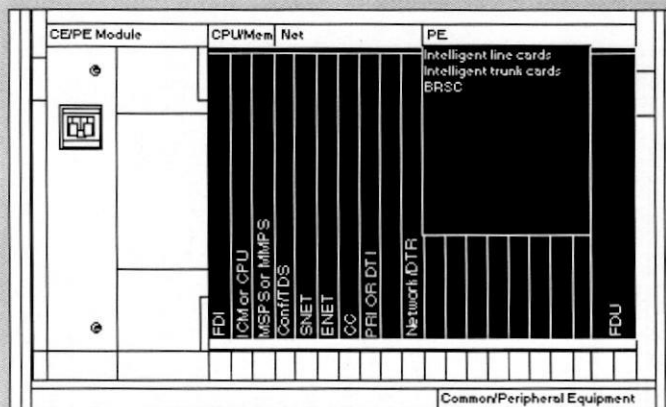
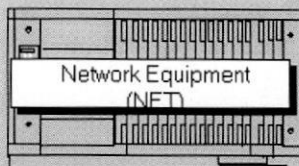
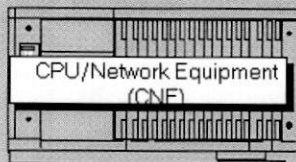
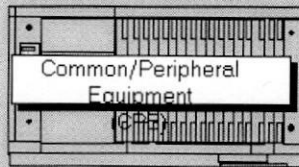


Dos módulos de red son requeridos para formar un grupo de red.

La numeración del grupo, repisa y loop para ambas tarjetas (ENET y SNET) es mostrada.

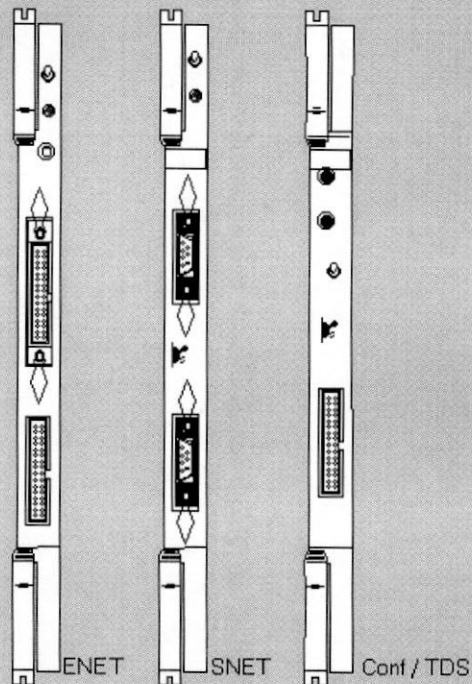
Esta es la configuración máxima del sistema.

TIPOS DE MODULOS DISPONIBLES



Tarjetas de red del modulo CE/PE.

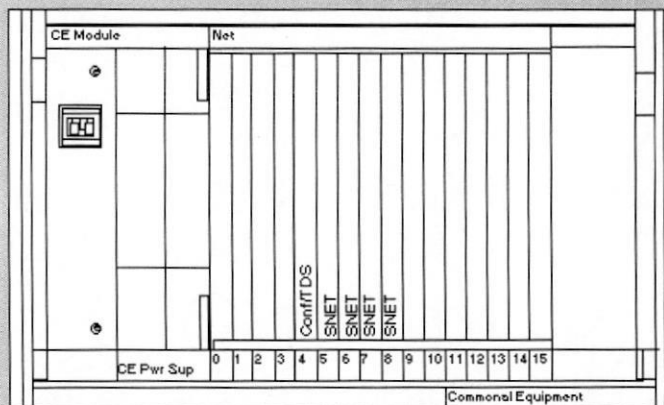
El módulo de equipo común/periférico usa las ranuras 4 hasta la 9 para alojar las tarjetas de red.



Las tarjetas ENETs, soportan dos loops por tarjeta.

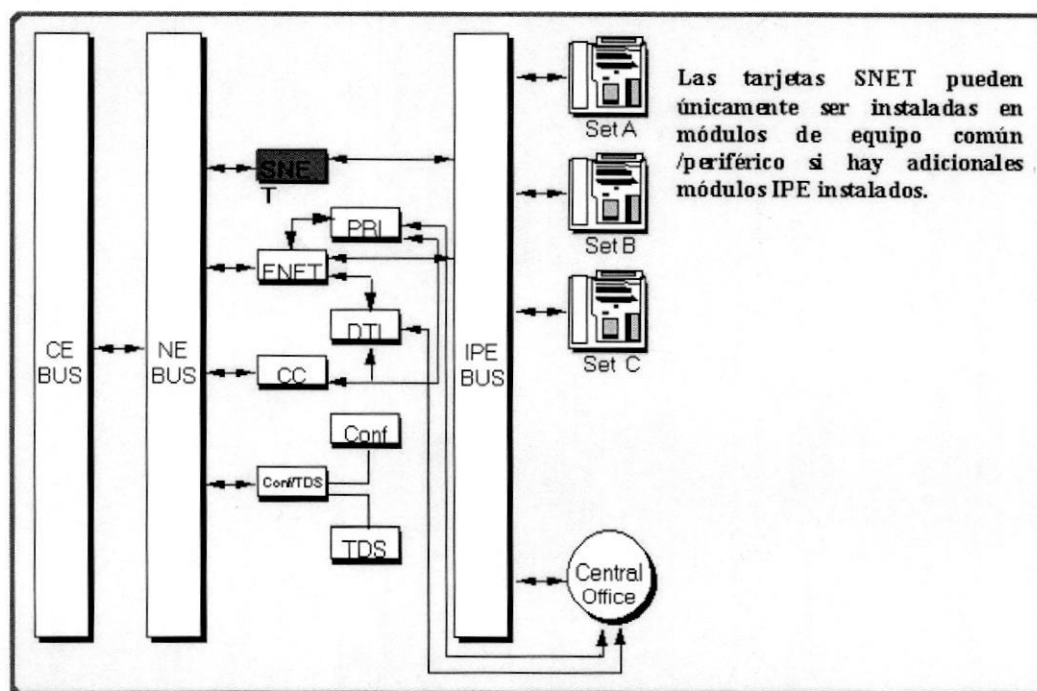
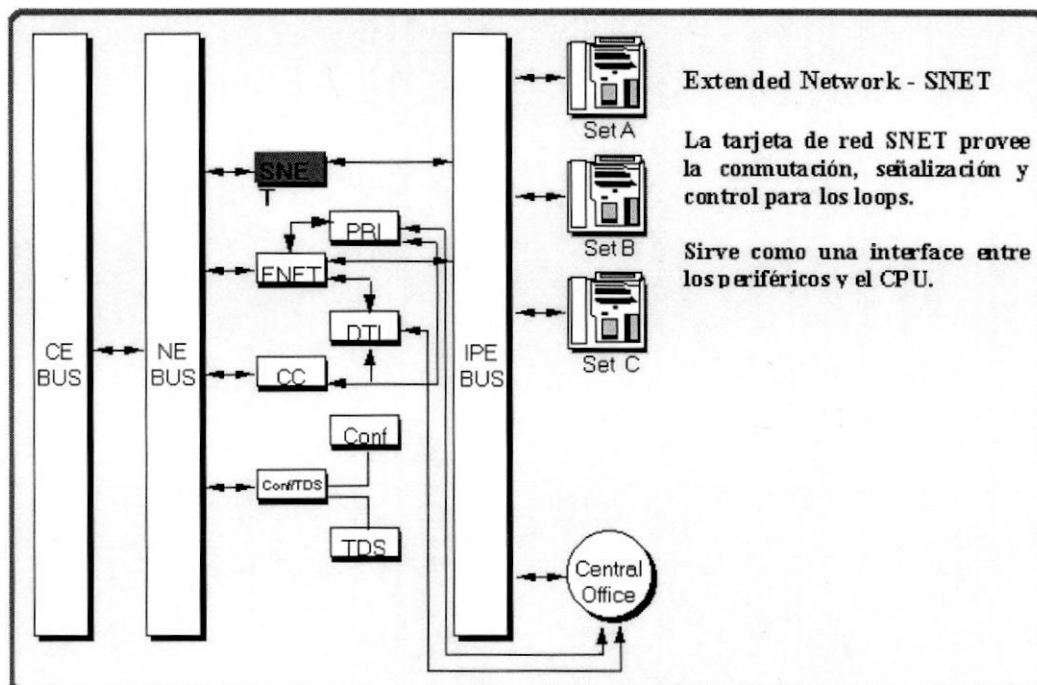
Las tarjetas SNETs, equivalen a cuatro loops de red por tarjeta.

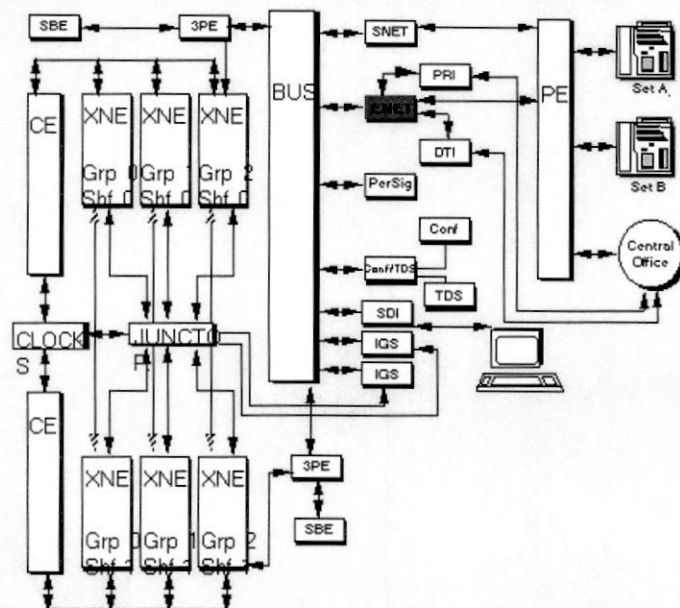
Conference/Tone and Digit Switch CONF/TDS provee las funciones de tonos y conferencia en una simple tarjeta. Esta tarjeta ocupa dos loops de red, uno para cada función



16 es el máximo número de loops soportados por un modulo de red.

Estos 16 loops pueden ser formados, usando alguna combinación de tarjetas ENETs, SNETs o Conf/TDS.



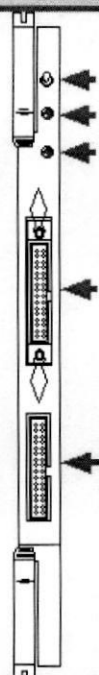


Enhanced Network:

The Enhanced Network (ENET) cards provide the switching, signaling, and control for two loops each. The ENET serves as an interface between the PE and the CPU.

The Network Module can hold up to eight ENET cards or a combination of ENET and SNet cards providing a total of 16 loops.

Note: The CONF/TDS card will limit the number of ENETs or SNETs available.



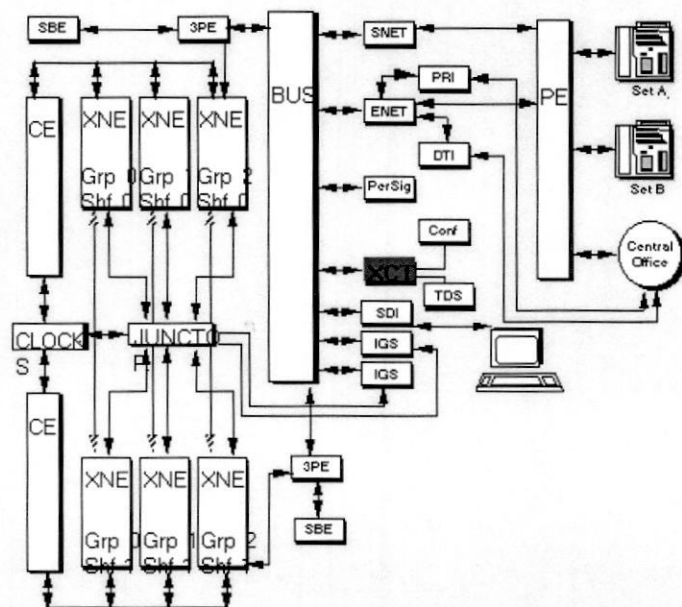
Faceplate features of the ENET are:

- ENB/DIS Switch: Used to manually hardware enable or disable the card.

- Two Red LEDs: When lit these LEDs indicate that a loop is disabled. The top LED indicates the even loop. The bottom LED indicates the odd loop.

- Two Cable Jacks: Used to connect the ENET to the PE modules it services.

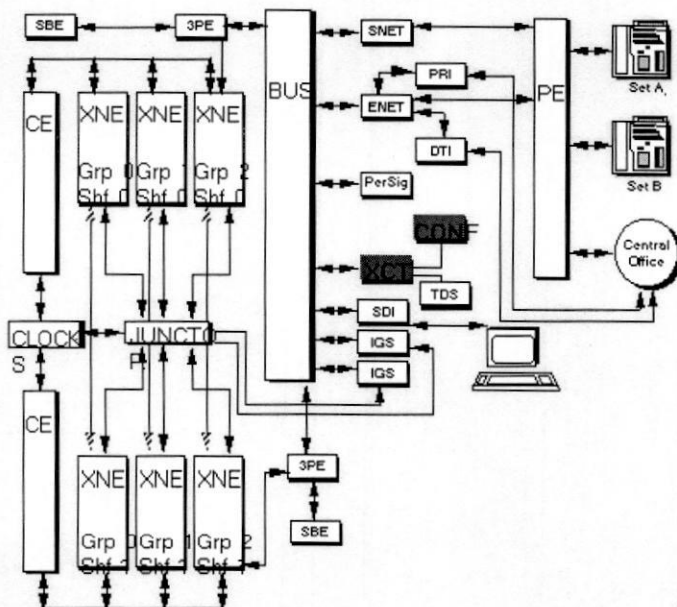




Extended Conference and Tone and Digit Switch:

The Conf/TDS provides both conference and tone and digit functions.

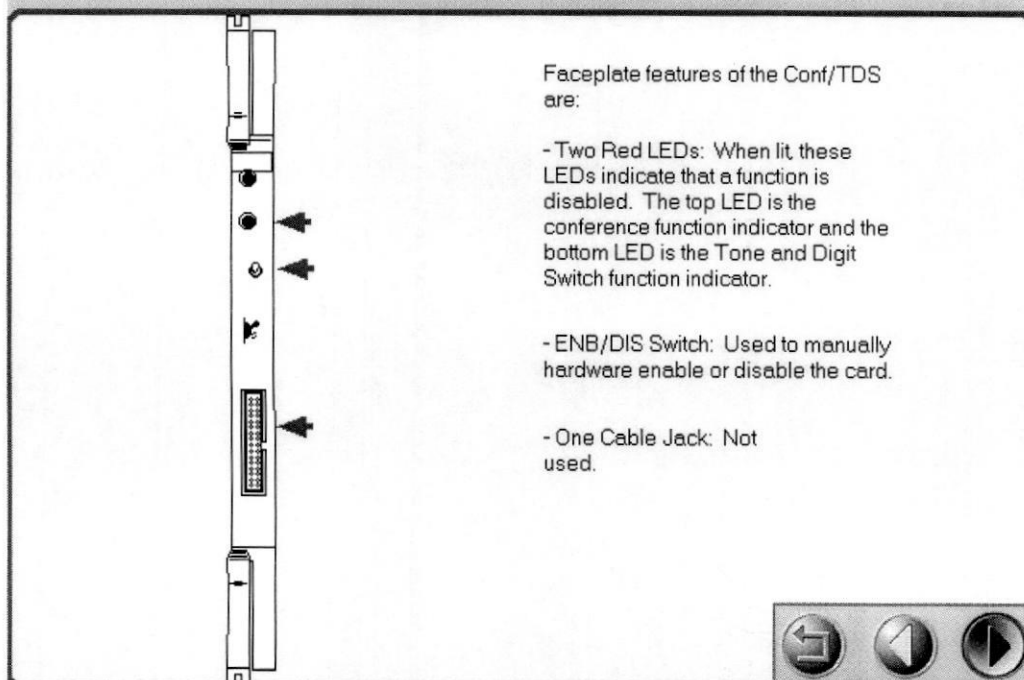
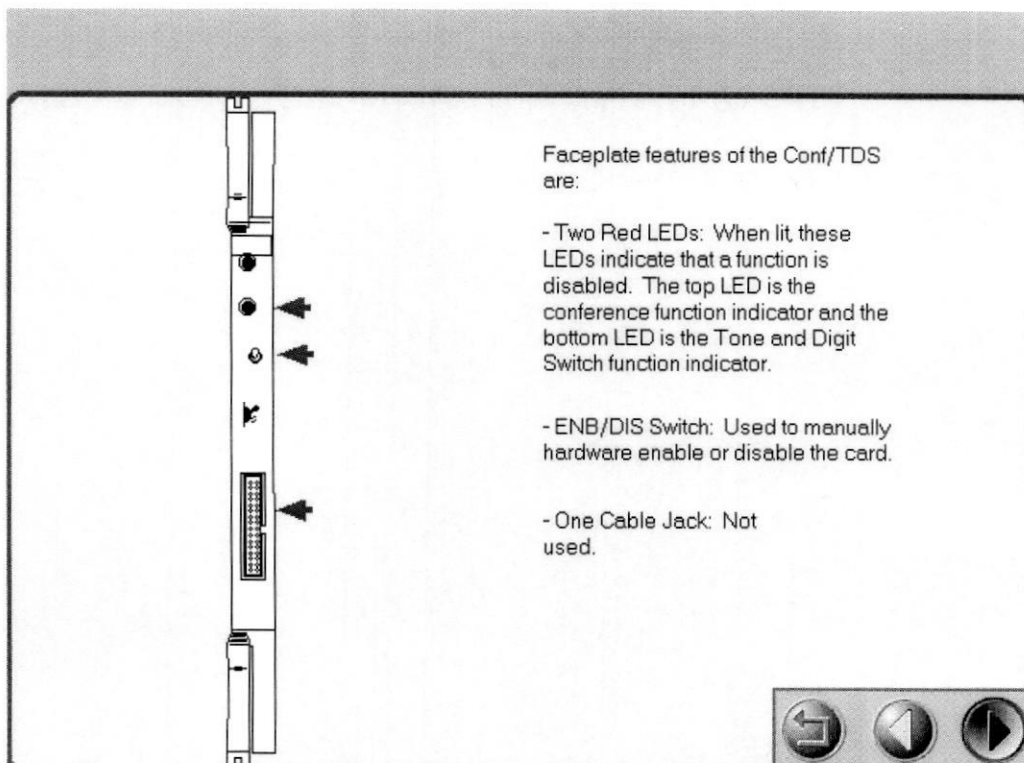
This one card replaces both the Conf and TDS circuit cards. In a typical configuration, one Conf/TDS card is configured in the module leaving 14 voice/data loops available.

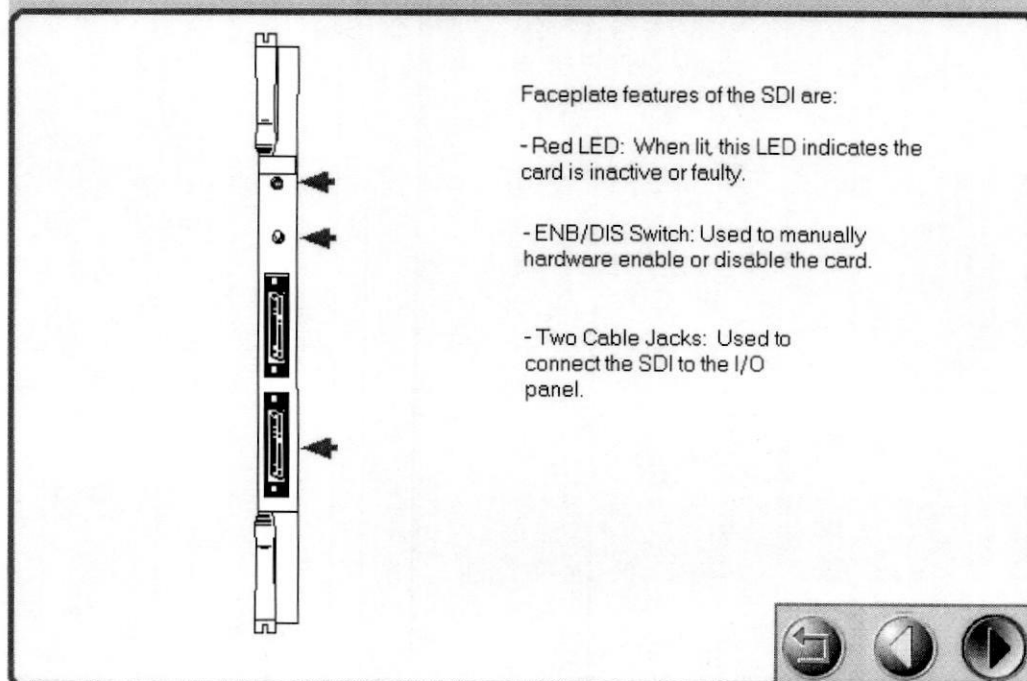
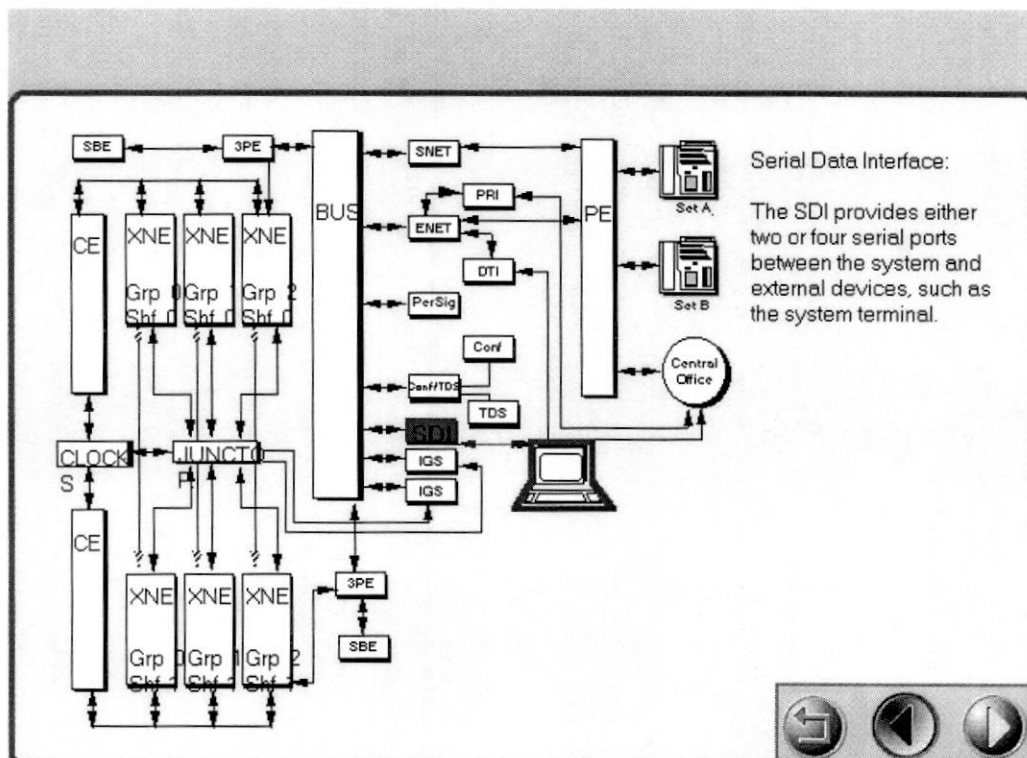


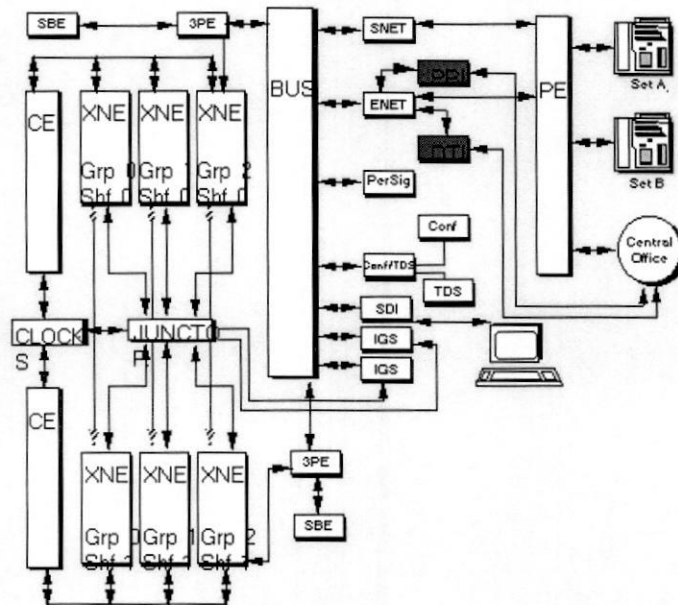
The conference function of the Conf/TDS controls the conferencing capability for the system.

It allows up to 15 simultaneous conferences between 30 people.





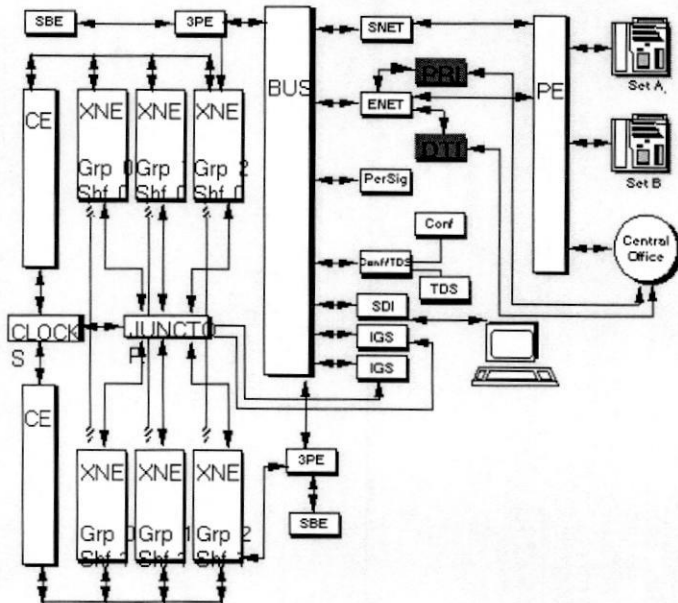




Primary Rate Interface or Digital Trunk Interface:

The PRI/DTI provide the interface with digital transmission lines that connect external sources such as personal computers. Either card requires two card slots.

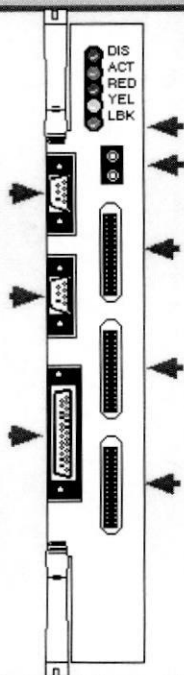
PRI/DTI is also available in one card.



PRI cards are used to connect ENET cards with the external source.

DTI cards are used to connect ENET cards with the external source.





Faceplate features of the PRI are:

- Five LEDs:

Red DIS - when lit, indicates circuit card failure.

Green ACT - when lit, indicates the circuit card is in Loopback mode.

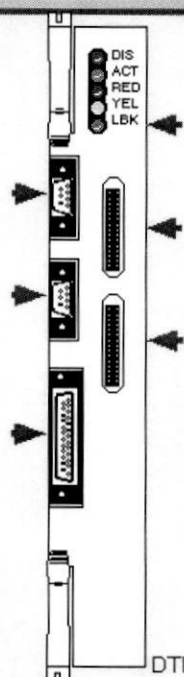
Red RED - when lit, indicates a local failure.

Yellow YEL - when lit, indicates a remote failure.

Green LBK - when lit, indicates a loop back test is being executed.

- Monitor Jacks: Used to monitor T1 signal with T1 test equipment.

- Six Cable Jacks: The top left and middle left jacks are for CC connections. The bottom jack connects to the ENET card it services. The top right jack connects to the trunk. The right middle jack connects to an echo canceller for satellite communications. The bottom right jack connects to special ISDN circuitry.



Faceplate features of the DTI are:

- Five LEDs:

DIS - when lit, indicates circuit card failure.

ACT - when lit, indicates the circuit card is functioning.

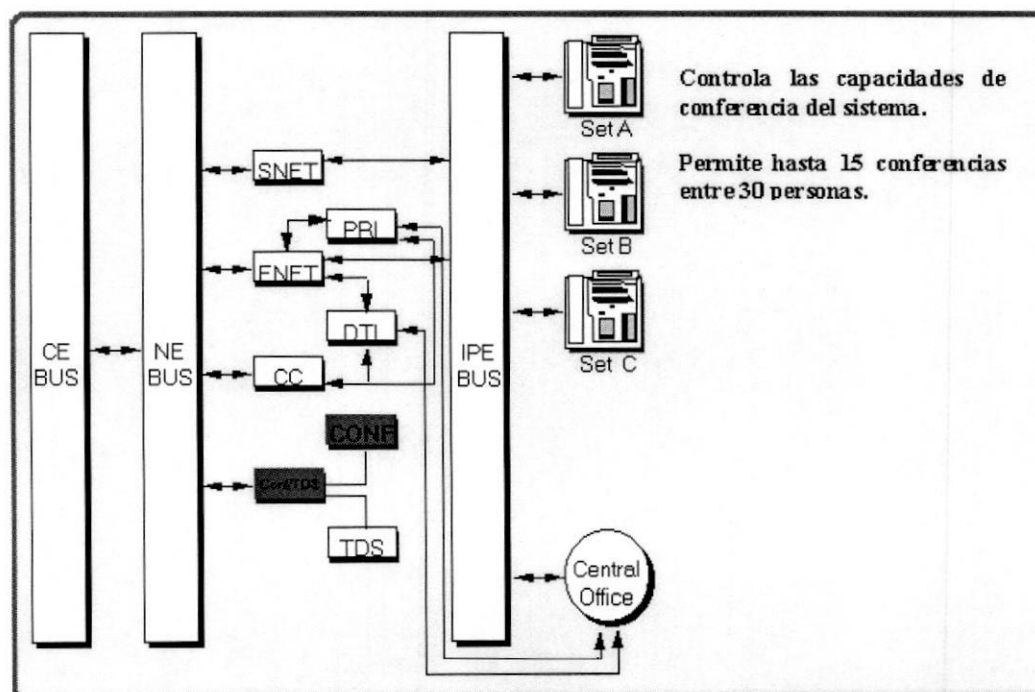
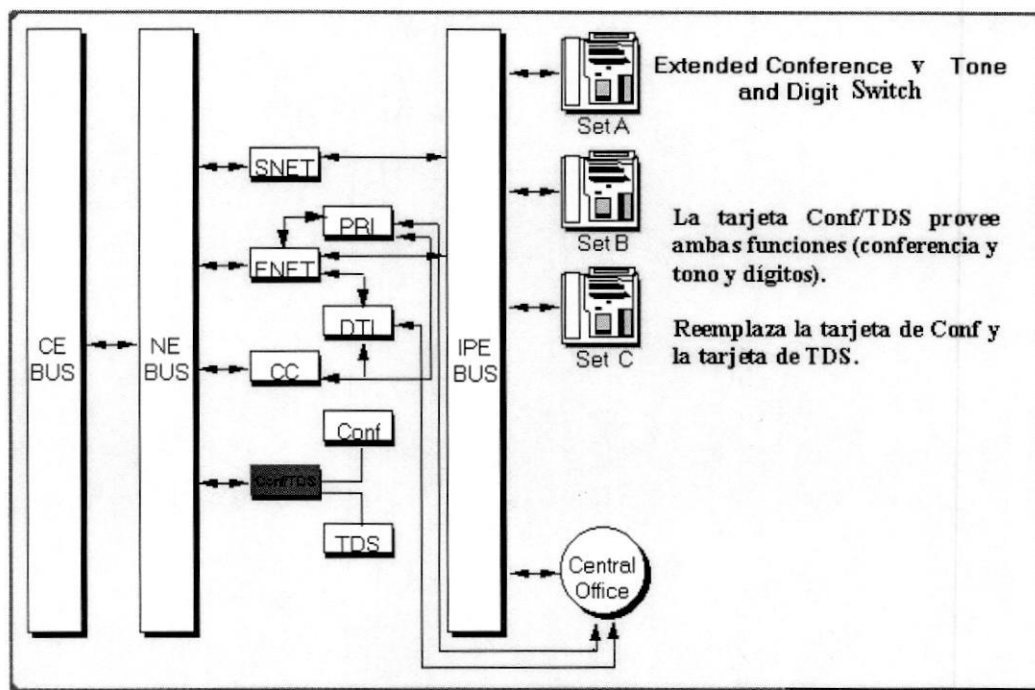
RED - when lit, indicates a local failure.

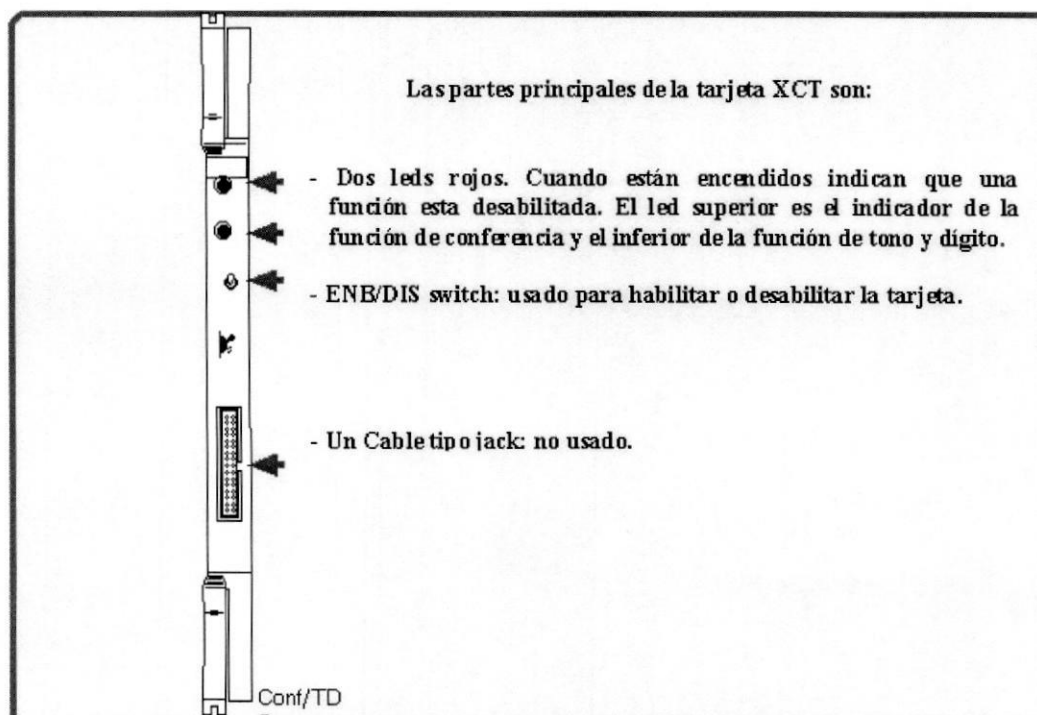
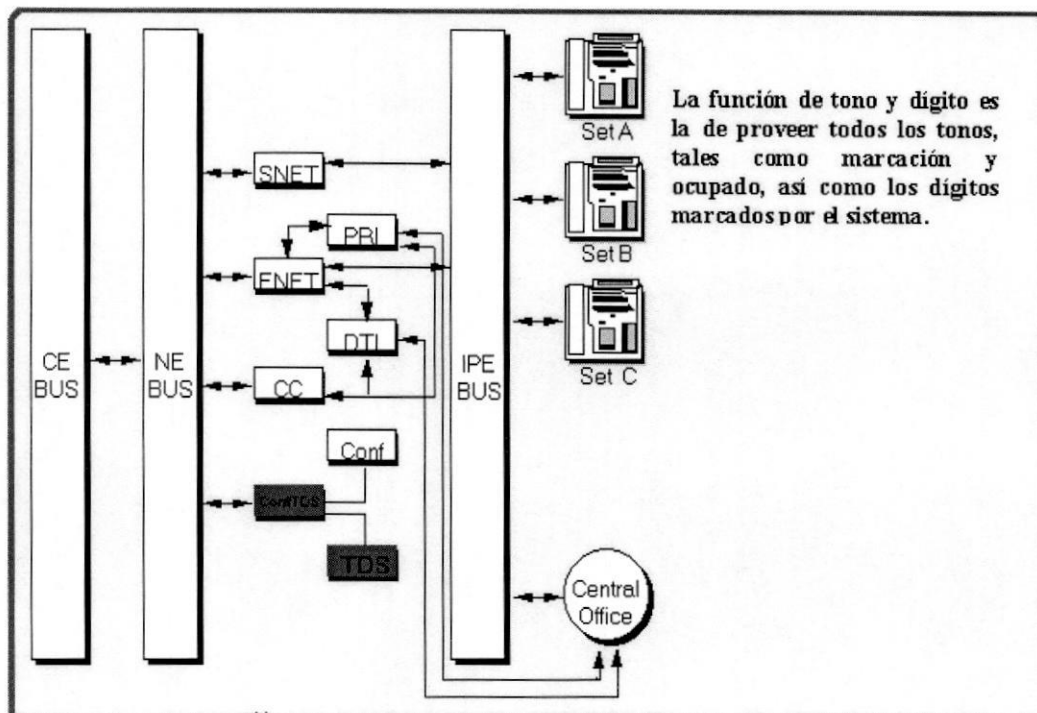
YEL - when lit, indicates a remote failure.

LBK - when lit, indicates a loop back test is being executed.

- Five Cable Jacks: The top left jack is unused. The middle left jack connects to the CC. The bottom jack connects to the ENET card it services. The top right jack connects to an echo canceller for satellite communications. The bottom right jack connects to the trunk.



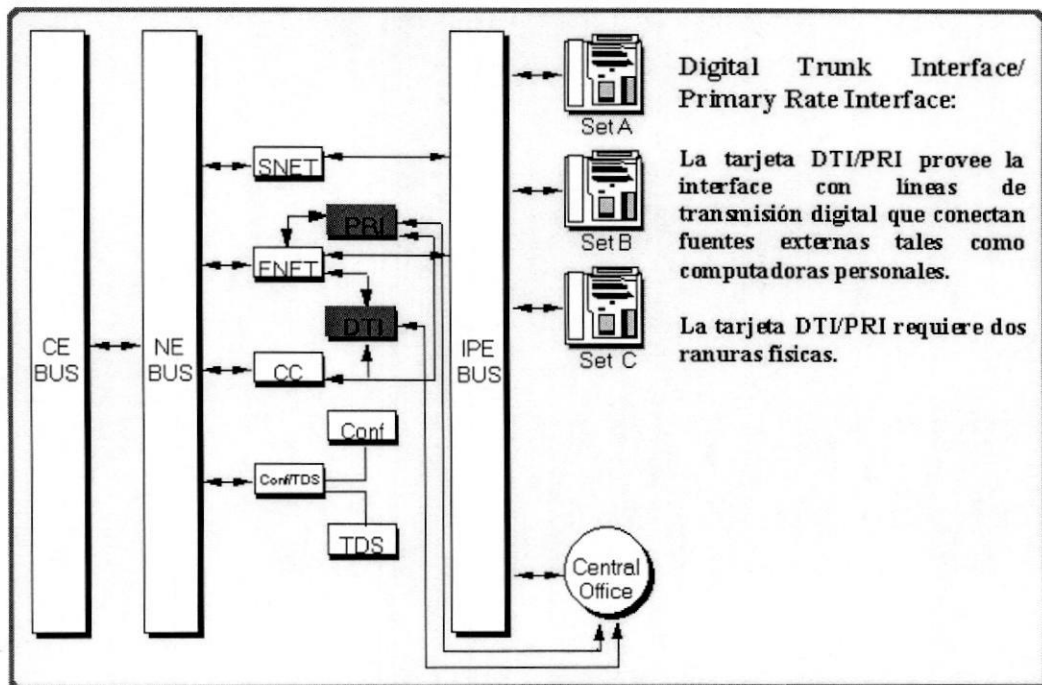


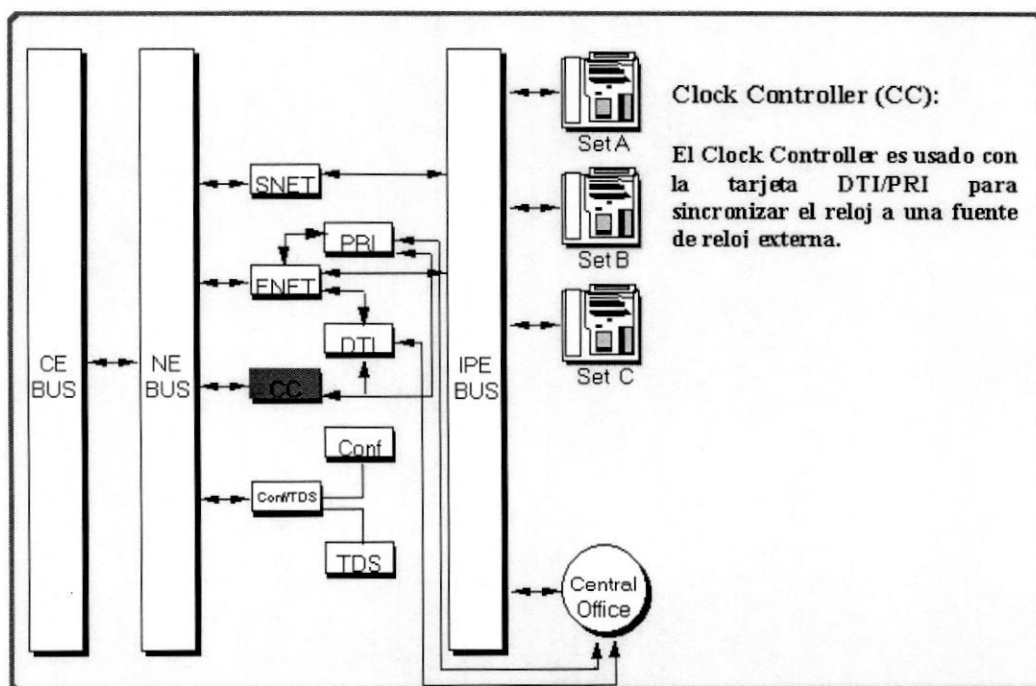
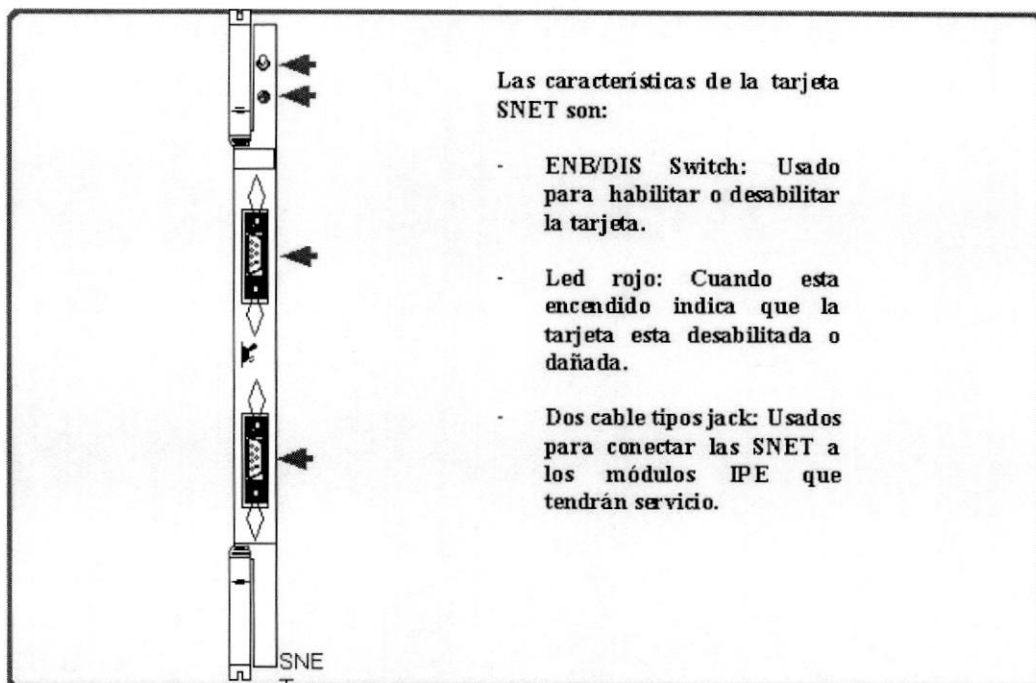


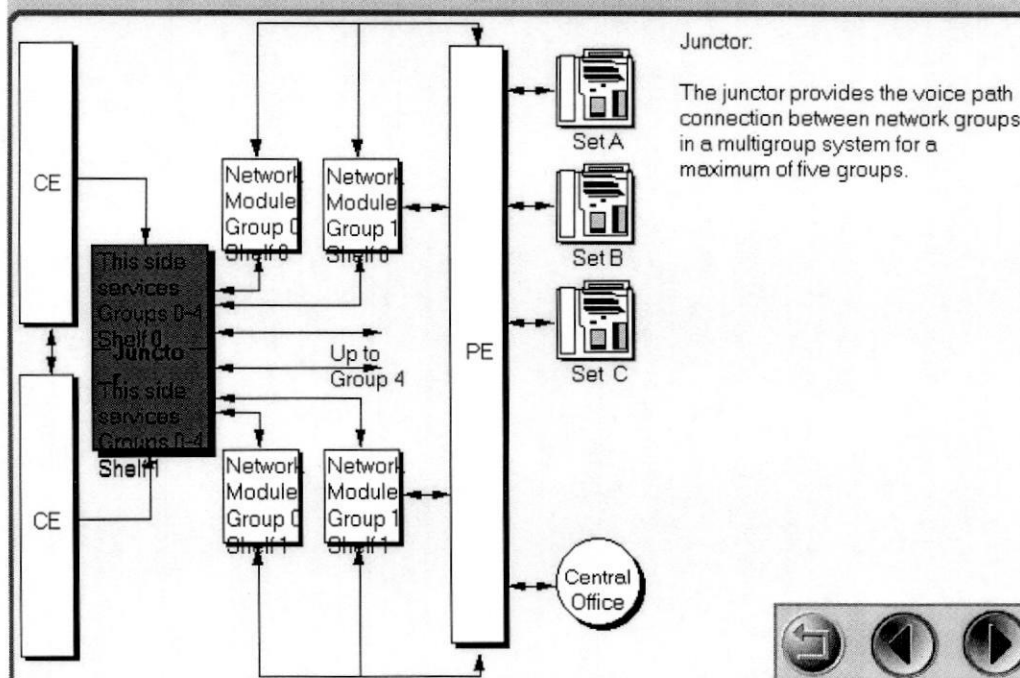
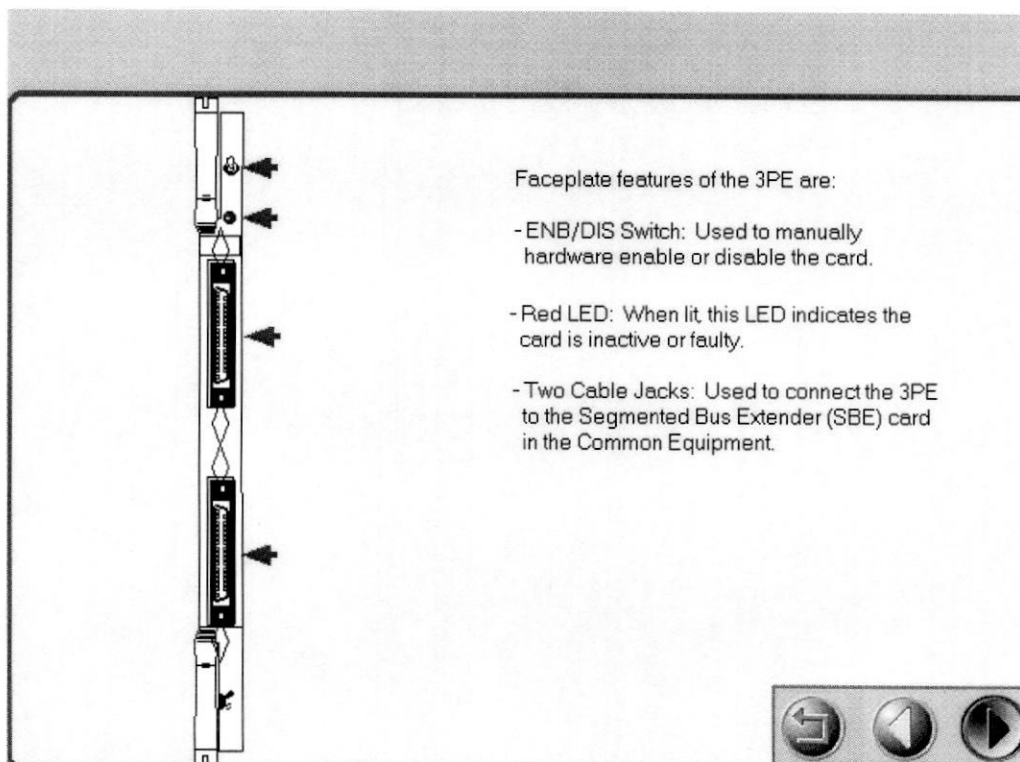


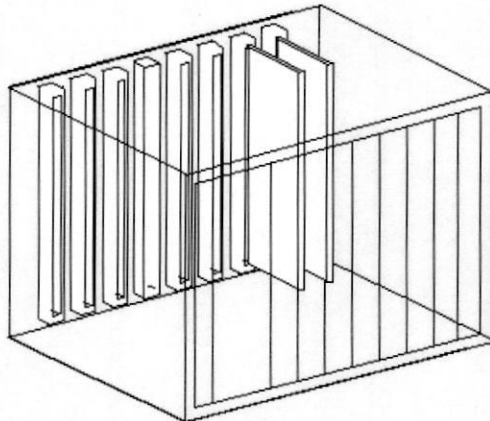
Las características del CC son:

- Led rojo: Cuando esta encendido indica que la tarjeta esta inactiva o fallando.
- ENB/DIS Switch: Usado para manualmente habilitar o desabilitar la tarjeta.
- Tres jacks de cables: Si una tarjeta DTI/PRI es usada, los dos jack superiores son usados para conectar el CC a la tarjeta DTI/PRI. El tercer jack es usado para conectar a otro CC en opciones 61 y al modulo de Intergrupo, J11 o J12 en una opción 71 y 81.



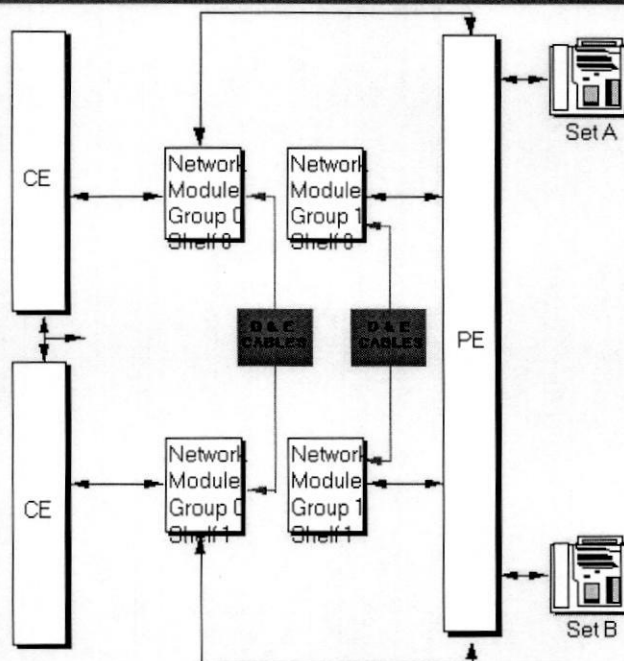






Bus Terminating Units (BTUs):

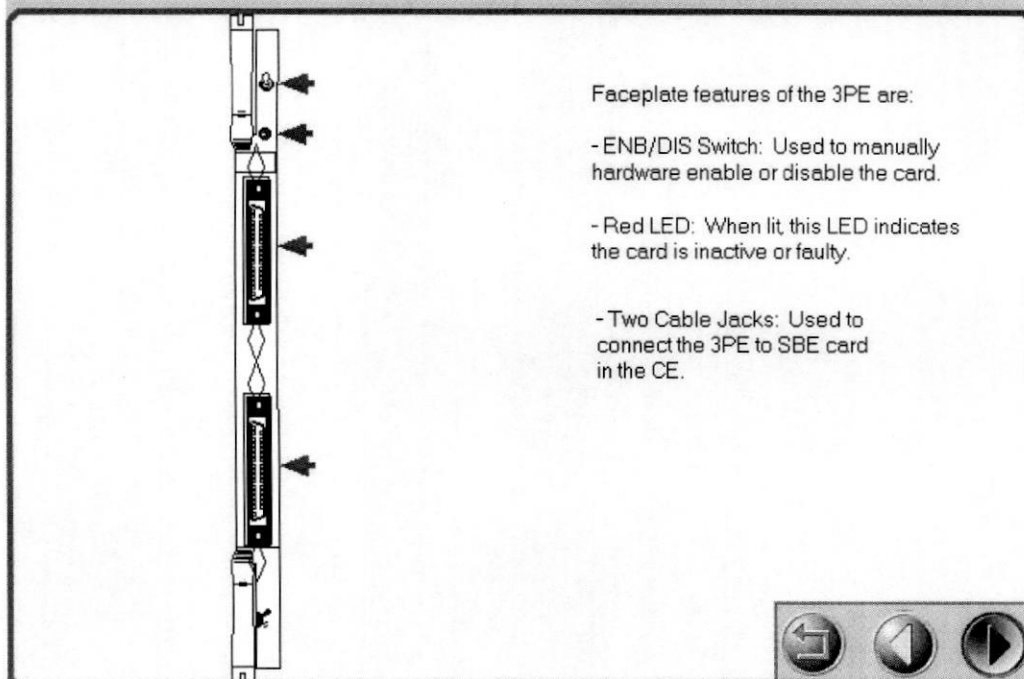
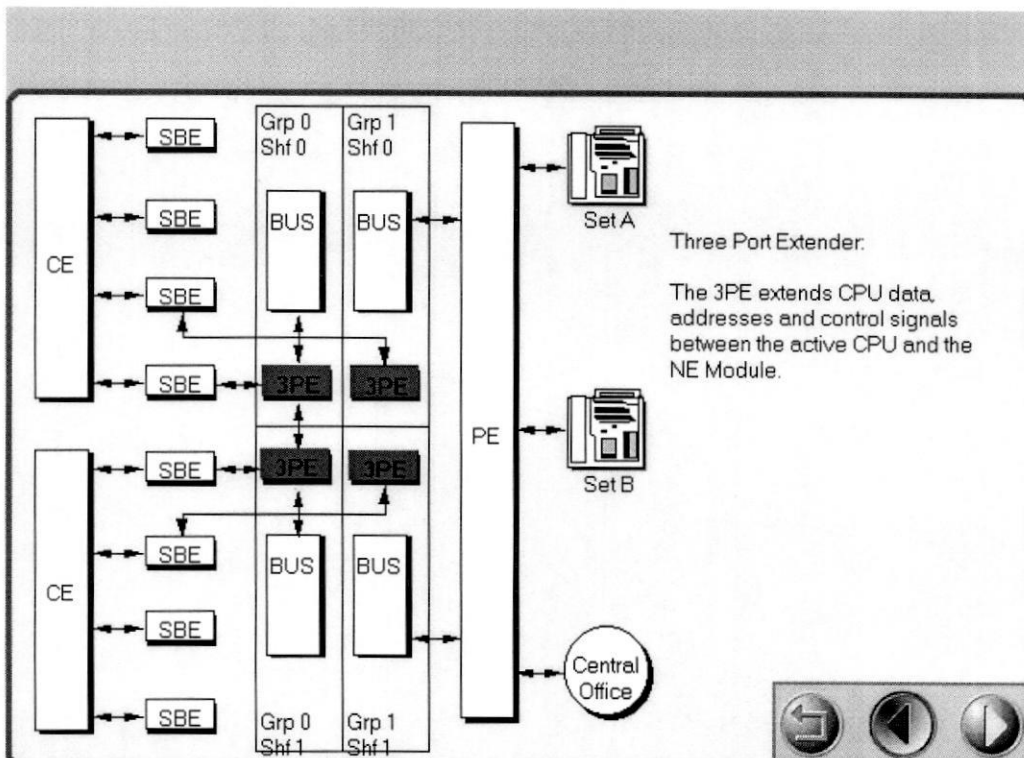
BTUs are located between circuit cards 11 and 12, and 12 and 13 of the Network Module. They are required to correctly terminate CE and NE buses.

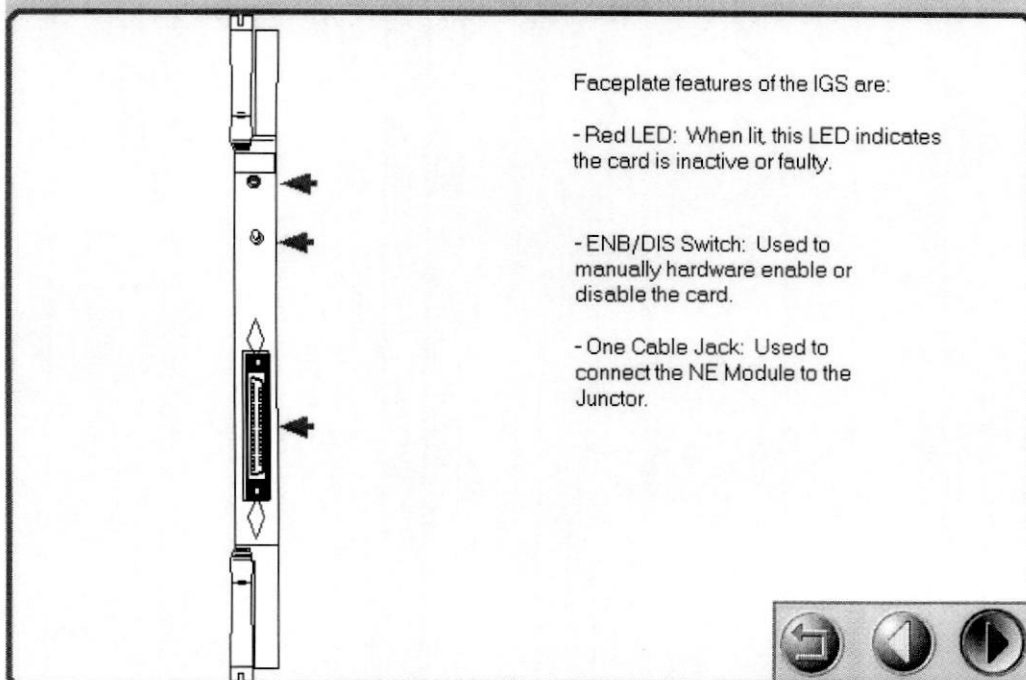
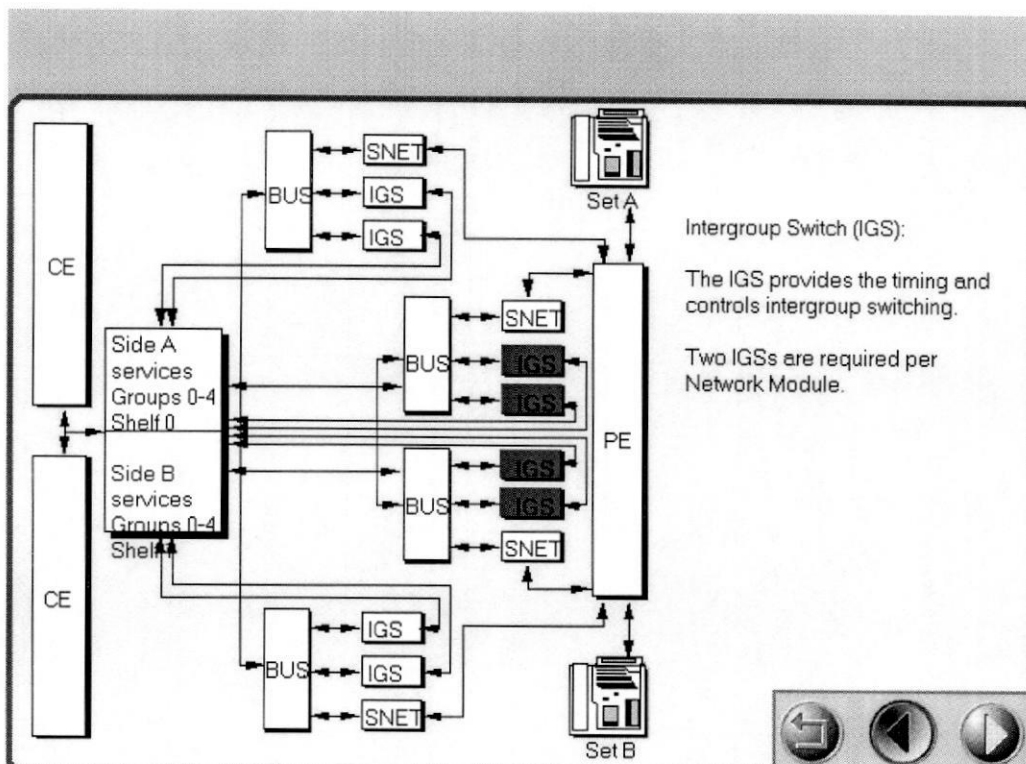


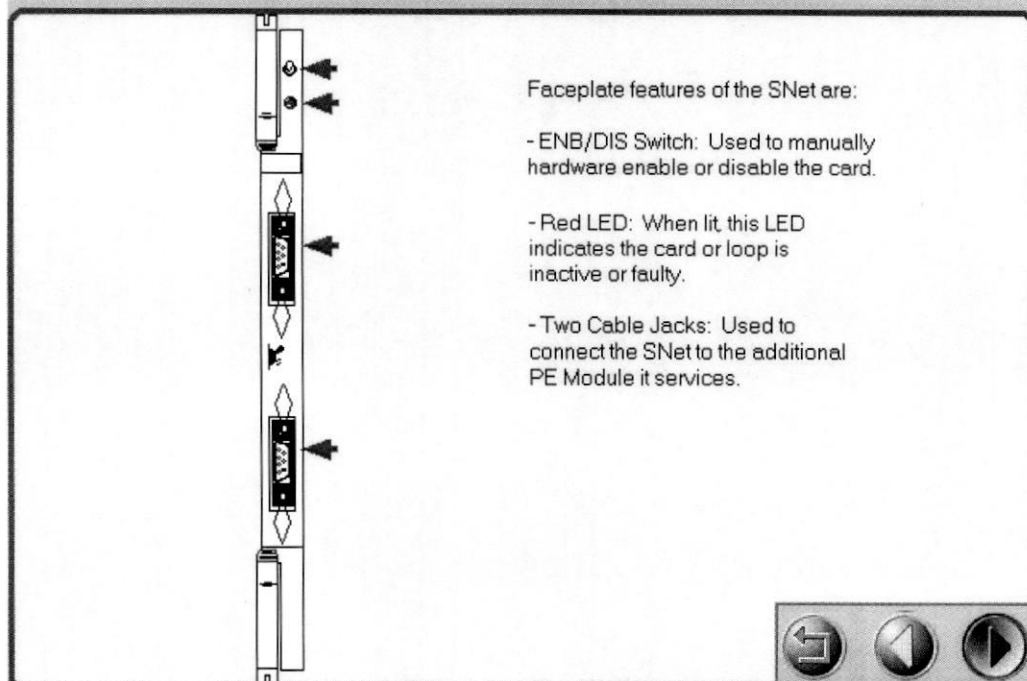
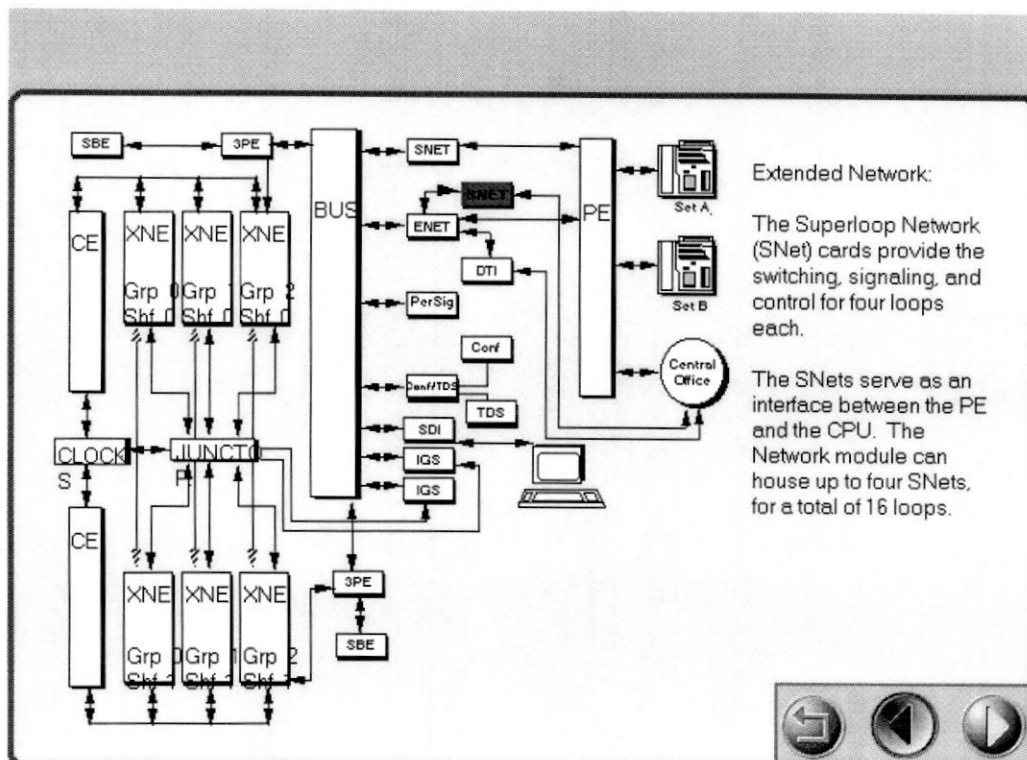
D and E cables:

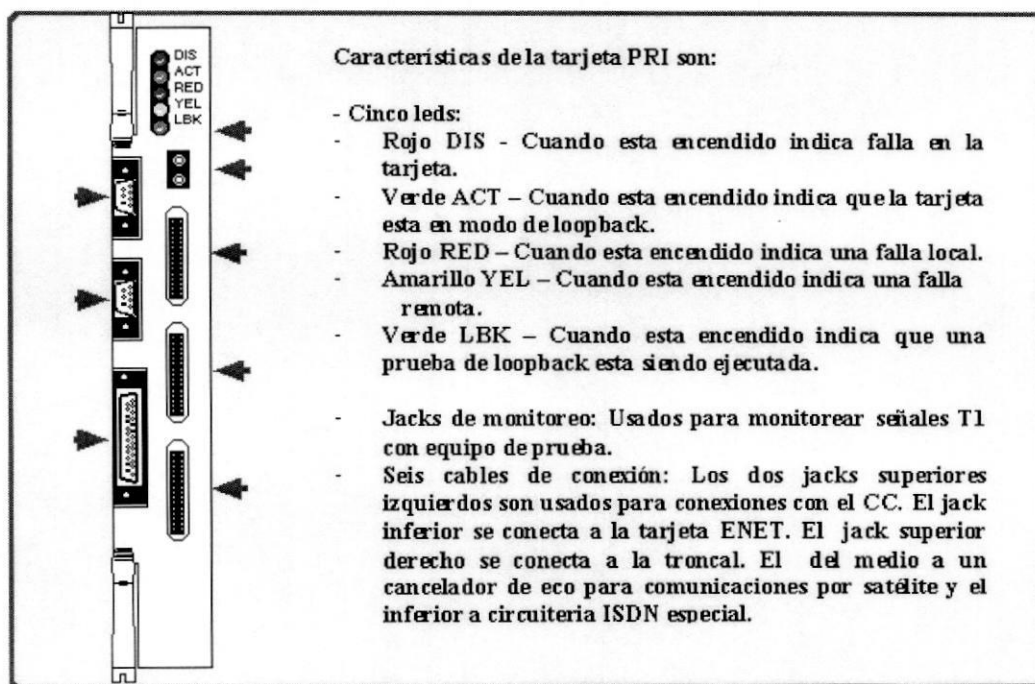
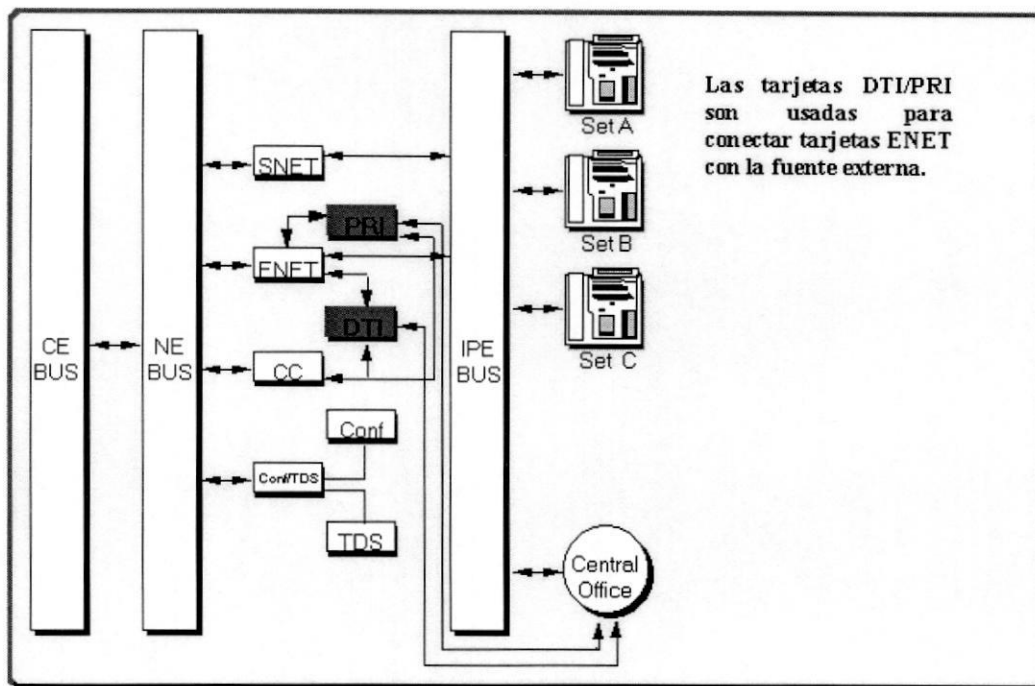
D and E cables provide the voice path connection between the NE Modules within a group.

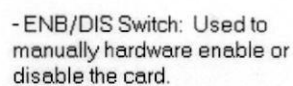
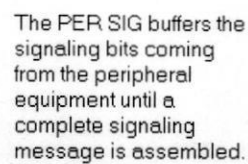


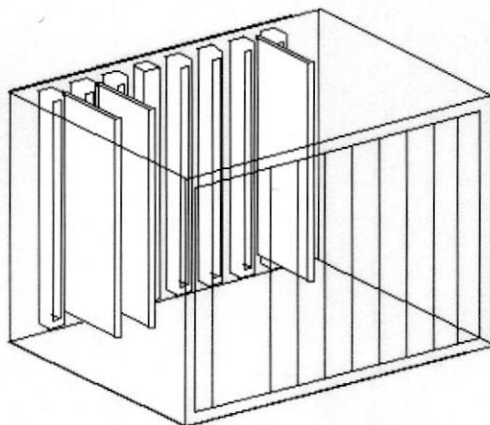






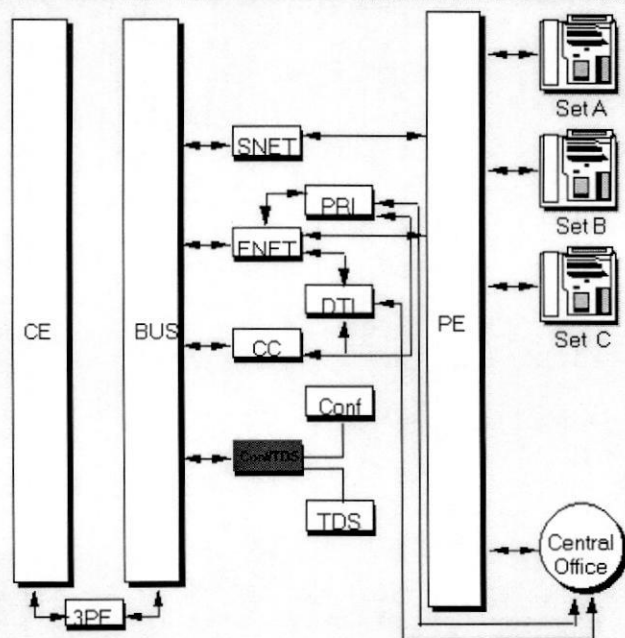






Bus Termination Units:

BTU's are located between circuit cards 1 and 2, 2 and 3, and 12 and 13 of the CPU/Network Module. They are required to correctly terminate CE and NE buses.



Extended Conference and Tone/Digit Switch (Conf/TDS):

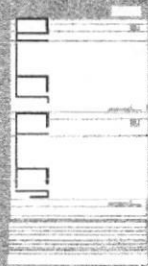
The Conf/TDS provides both conference and tone and digit functions. It replaces both the Conf and TDS circuit cards.





CARACTERISTICAS GENERALES Software X11

OPCION	Tipo maq.	min. Rls.	max. Rls.
11	14	15	19
11E	14	20	20
21A	10	15	17
21	10	15	17
21E	15	18	20
51	11	15	20
51C	17	20	20
61	11	15	20
61C	18	19	20
71	12	15	20
81	16	18	20



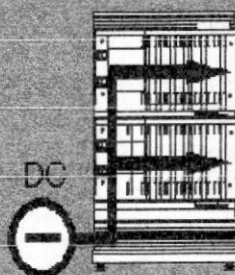
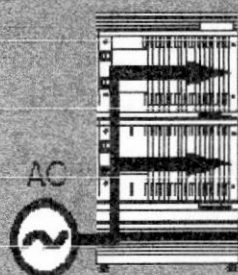
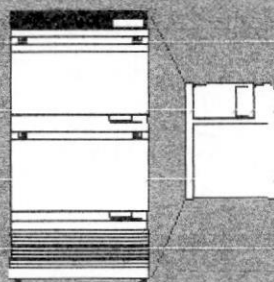
Power Equipment

Morden I features a modular power distribution and security. As part of the modular design, the Morden I power system provides:

- power supplies located in each module rather than in separate centralized power supplies

- a universal 100% redundant power wiring harness which distributes input power and monitor signals to the power supplies each module

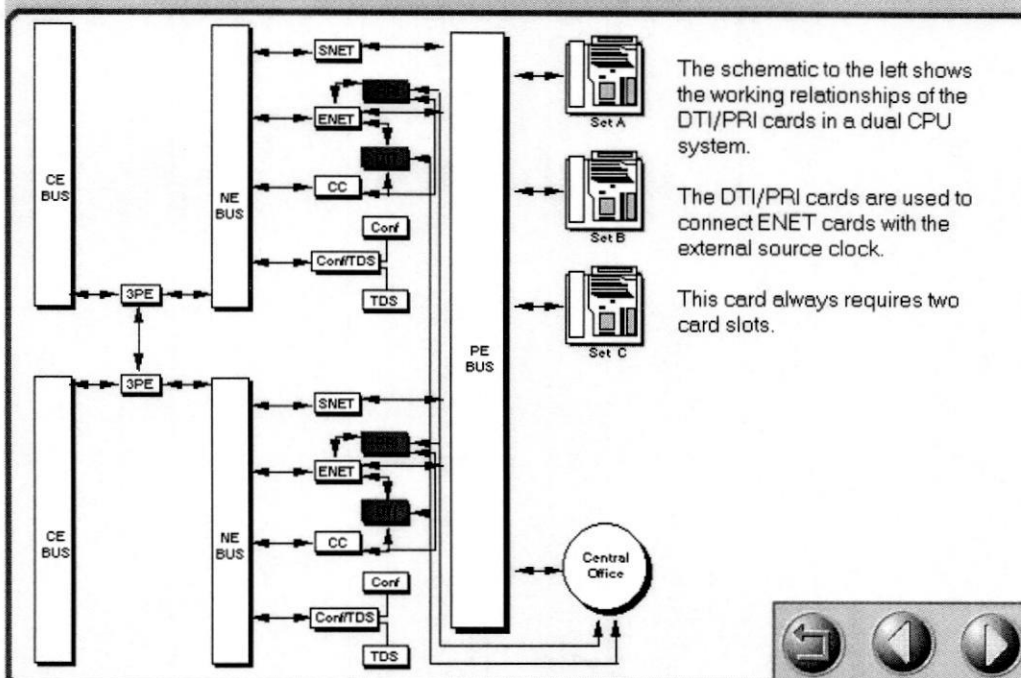
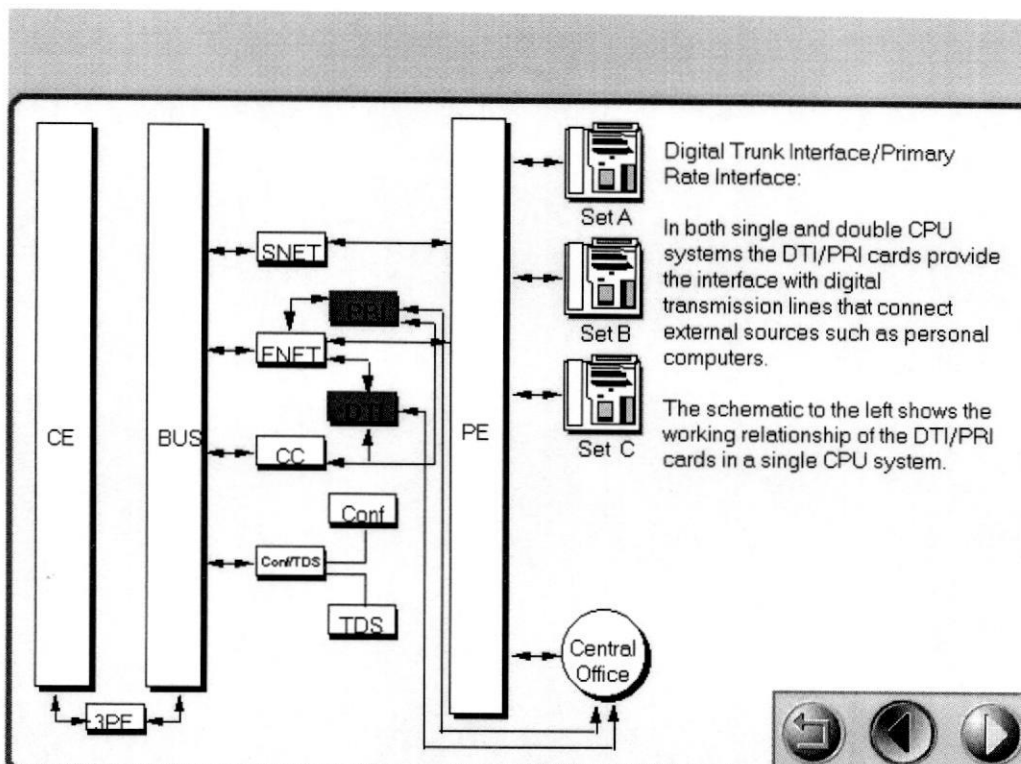
- in, data backup capabilities on a per-rack basis



Although AC and DC are not power components of the Morden I system, they function similarly. In the AC systems, AC power is input to the pedestal and distributed to each of the modular AC/DC power supplies. In the DC systems, DC power is input to the pedestal and distributed to each of the modular DC/DC power supplies.

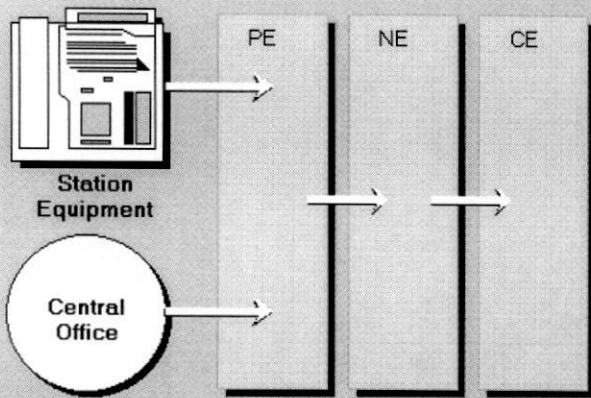
Except for the power connections and the power wiring harness, all other functional elements within the system are the same for AC and DC systems.



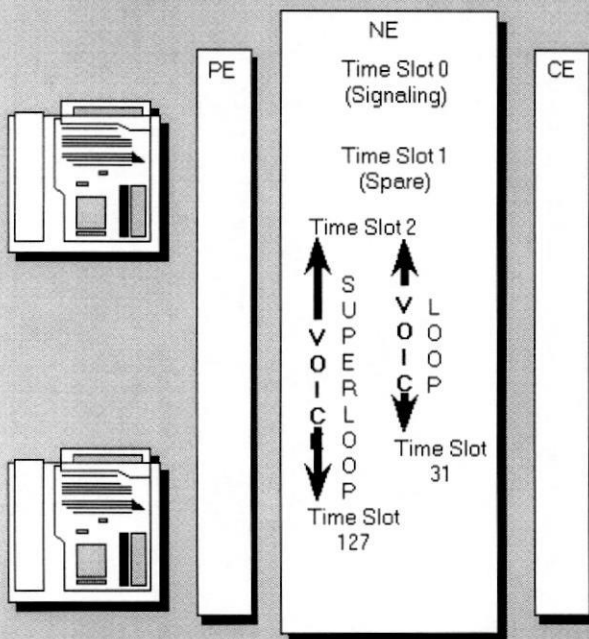


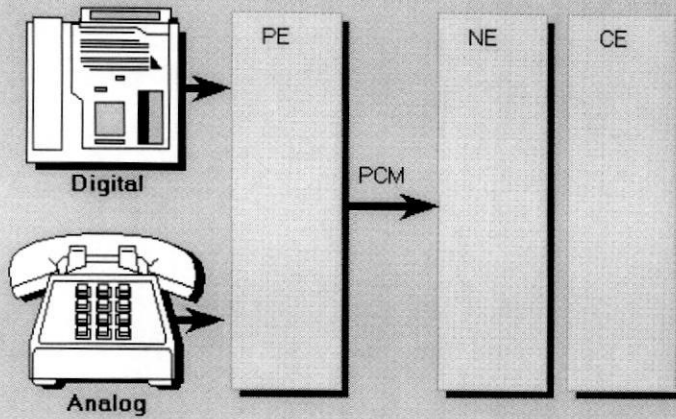


Peripheral Equipment provides the interfaces between the NE, station equipment and trunks.



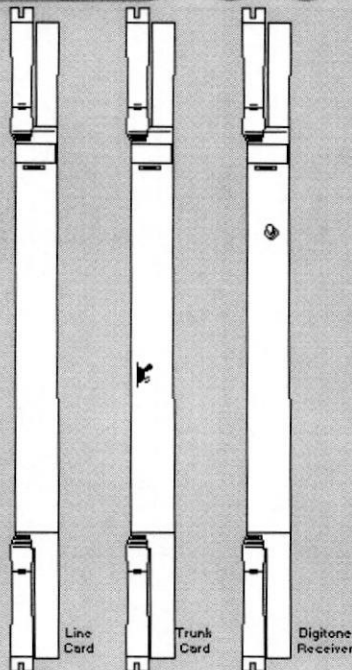
The PE signals the CE when a call request is being made. It does so via the Network on timeslot 0.





The PE ensures that the various signals from the different types of station equipment are in the proper format for the system during a call.

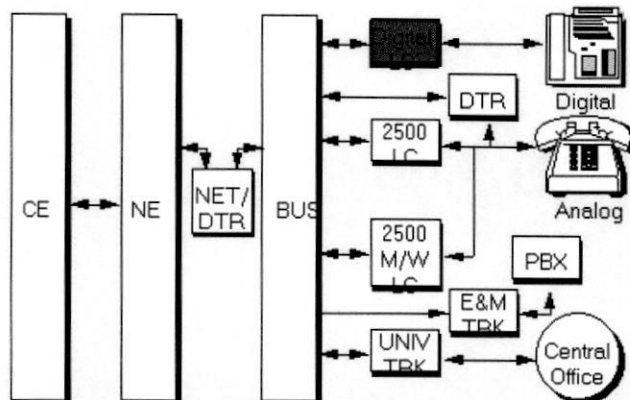
The proper format is Pulse Code Modulation, PCM.



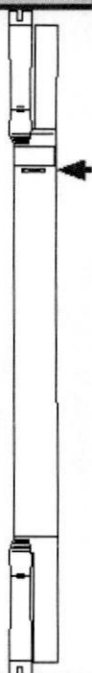
To accomplish the formatting, the PE uses the components shown.

Use your mouse to select each card for more information.



**Digital Line Card:**

Provides the voice, data and signaling interface for 16 digital integrated sets.

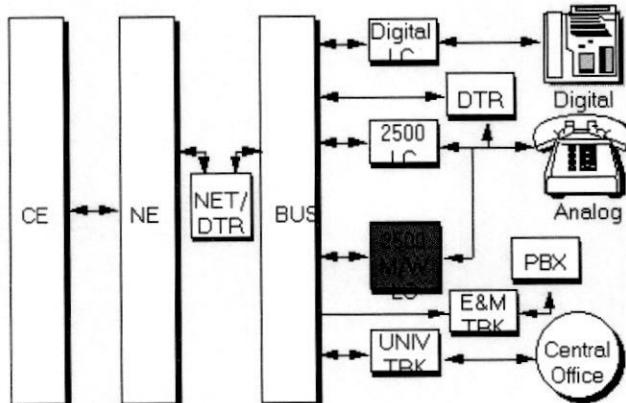


Faceplate feature of the Digital LD is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.

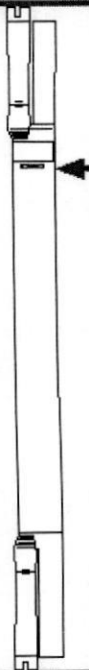
Message Waiting Line Card:

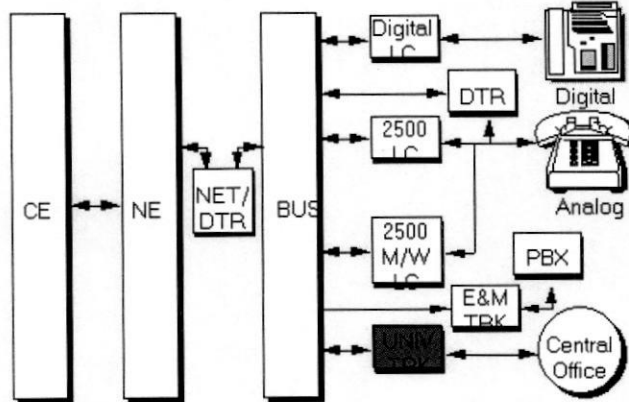
Provides the voice and data interface for 16 analog sets and includes message waiting circuitry.



The faceplate feature of the 2500 M/W LC is:

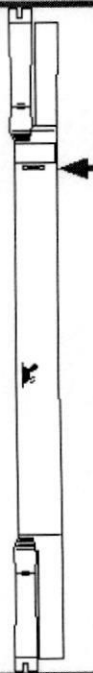
- Red LED: When lit, indicates the card is disabled and/or not programmed in software.



**Universal Trunk Card:**

Provides eight interface connections from the trunk facility to the CE/PE bus. Each interface can be individually configured to operate as:

- a Central Office trunk
- a Direct Inward Dial trunk
- a Recorded Announcement trunk
- a Paging trunk

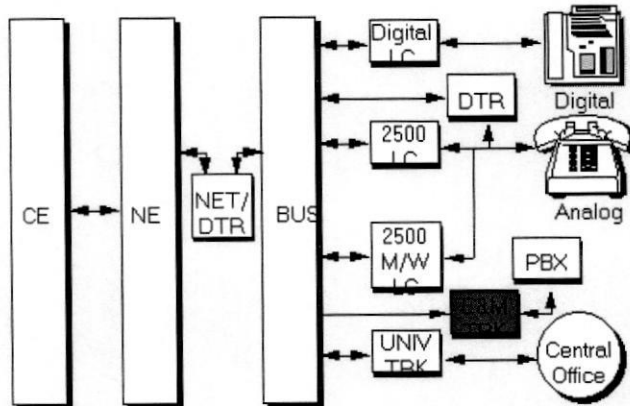


The faceplate feature of the Universal Trunk Card is:

- Red LED: When lit indicates the card is disabled and/or not programmed in software.

E and M Trunk Card:

Provides four analog Tie trunk interfaces.



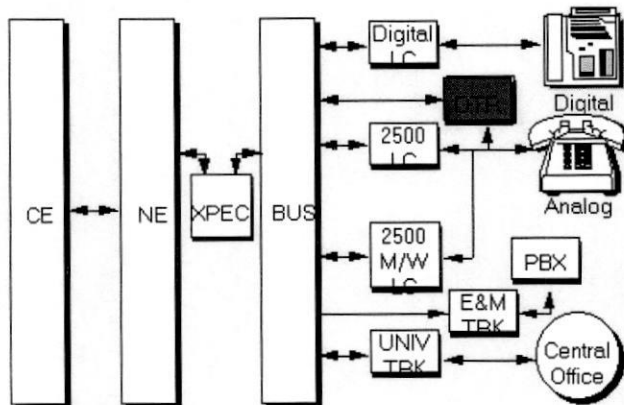
The faceplate feature of the E & M Trunk card is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.



Digitone Receiver:

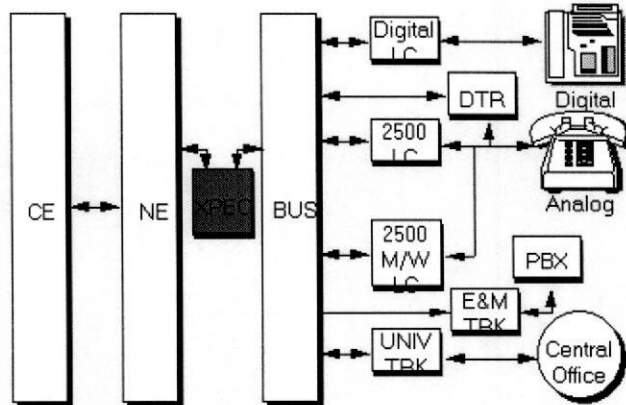
It is used to connect DTMF to digital signals for processing by the CPU for up to 8 analog sets.



The faceplate feature of the DTR card is:

- Red LED: When lit, indicates the card is disabled and/or not programmed in software.

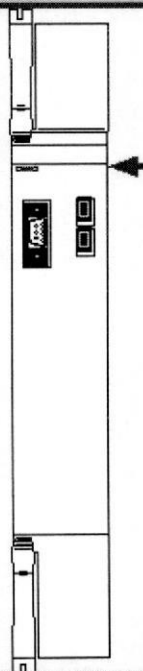


**Peripheral Controller-2:**

Provides the primary interface and control function between NE and PE. The Cont-2 interfaces up to two SNETs. This allows a single Intelligent Peripheral Equipment Module with up to 16 PE cards to be served by two superloops.

Peripheral Controller-4:

Provides the primary interface and control function between NE and PE. The Cont-4 interfaces up to four SNETs. This allows a single Intelligent Peripheral Equipment Module with up to 16 PE cards to be served by four superloops.



Faceplate features of the Controller card are:

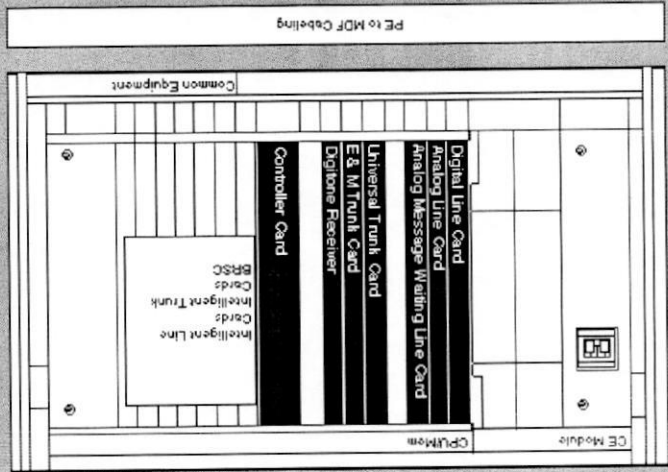
Note: Cont-2 and Cont-4 faceplate features are identical.

- Red LED: When lit, indicates the card is disabled. When the card is tested the LED will flash three times and then extinguish.



The Intelligent Peripheral Equipment (IPE) Module uses slots 0 through 15 to house IPE circuit cards.

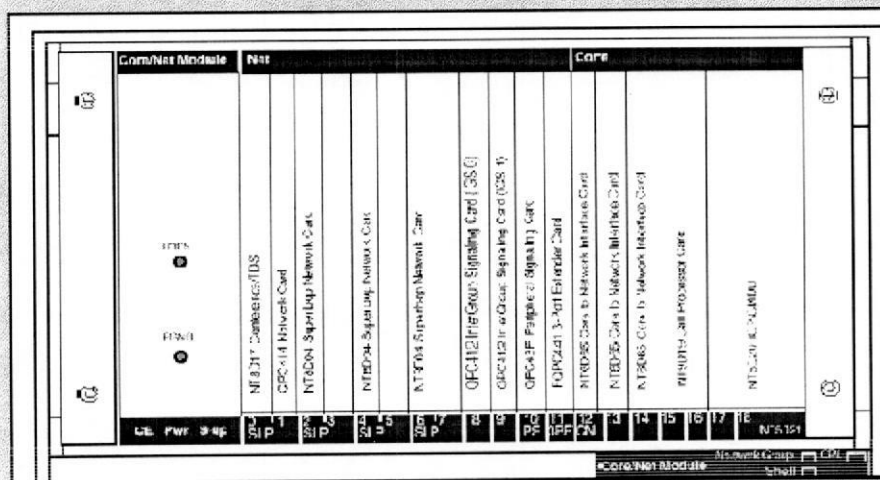
Use your mouse to select each highlighted card for more information.

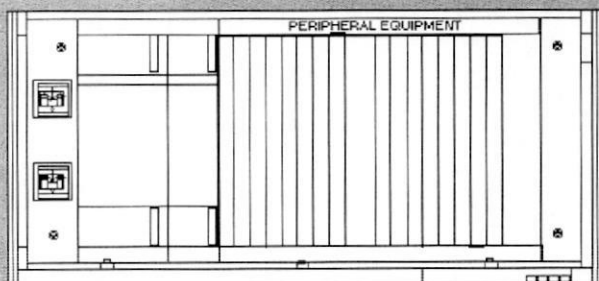


NTSD21 CORE/NETWORK MODULE

Este modulo provee las funciones de control común e interface de red en las opciones 51C, 61C y 81C empezando con software X11 release 21.

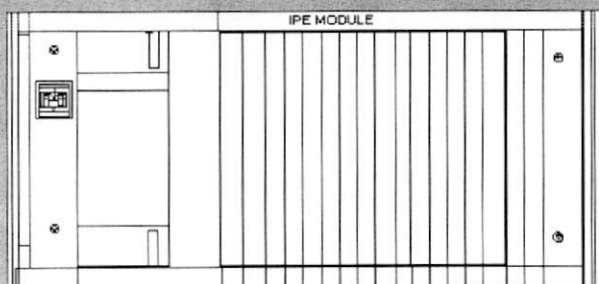
Dos Modulos CORE/NETWORK son requeridos en la opción 61C y 81C y un modulo es requerido en la opción 51C. Los dos modulos en la opciones 61C y 81C proveen operaciones de control común redundante. Si hay una falla sobre uno de los modulos todas las funciones son transferidas a las tarjetas adecuadas en el otro modulo sin una perdida de servicio.





The CE/PE Power Supply is used in Common/Peripheral Equipment Modules and local and remote site Remote Peripheral Equipment (RPE) modules. It is installed in the slot labeled CE/PE Pwr Sup on the left side of the module.

The CE/PE Power Supply uses 208 VAC input power.



CE & NE Circuits
+5 and +/- 12 VDC logic

Digital Set
+8.5 VDC signaling



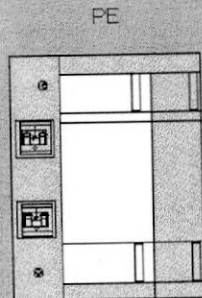
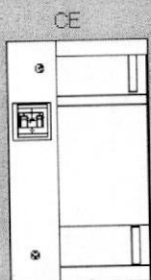
Multi-line Set
+/- 15 VDC signaling

500/2500 Set
-48 VDC talk battery
-150 VDC MW lamp voltage



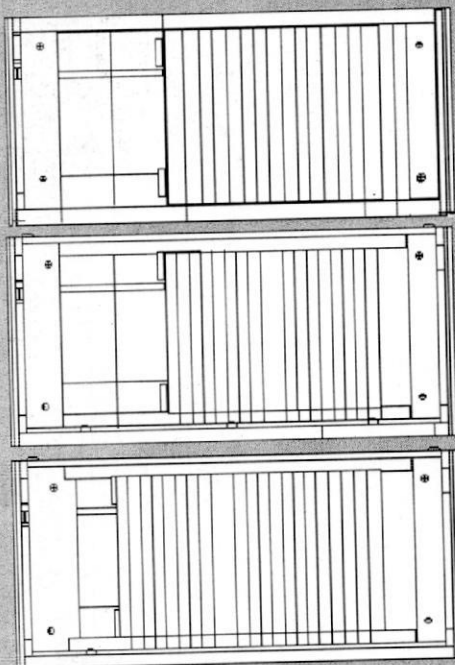
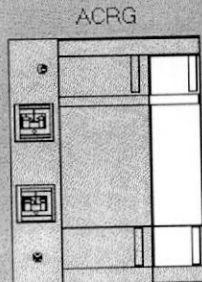
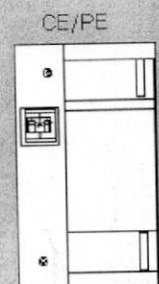
The CE/PE Power Supply produces +5 and +/- 12 VDC logic for CE and NE circuits, +8.5 VDC signaling voltages for multi-line sets and -48 VDC talk battery and -150 VDC message waiting lamp voltages for 500/2500 telephones.





All power supplies are protected by a circuit breaker located on the left side of the module. If more than one power supply is installed, the top breaker protects the left most power supply and the bottom breaker protects the power supply on the right. A green LED indicates the power supply is operational.

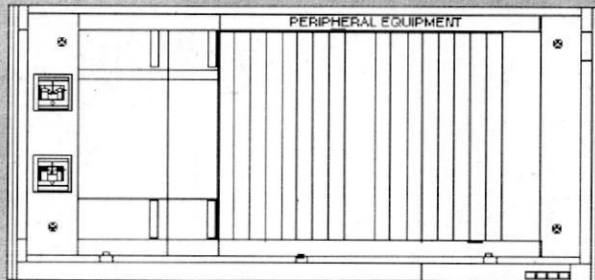
Select a power supply for more information, or the forward arrow to learn about DC power.



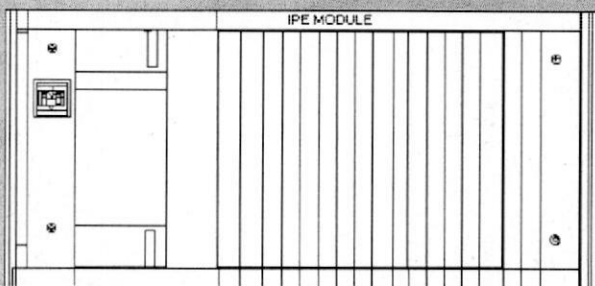
The Common Equipment Power Supply is used in the CPU Module, the Network Module, and the CPU/Network Module. It is installed in the slot labeled CE Pwr Sup on the left side of the module.

The +5 and +/- 12 VDC logic is provided to the Common Equipment and Network modules circuit cards via the backplane.



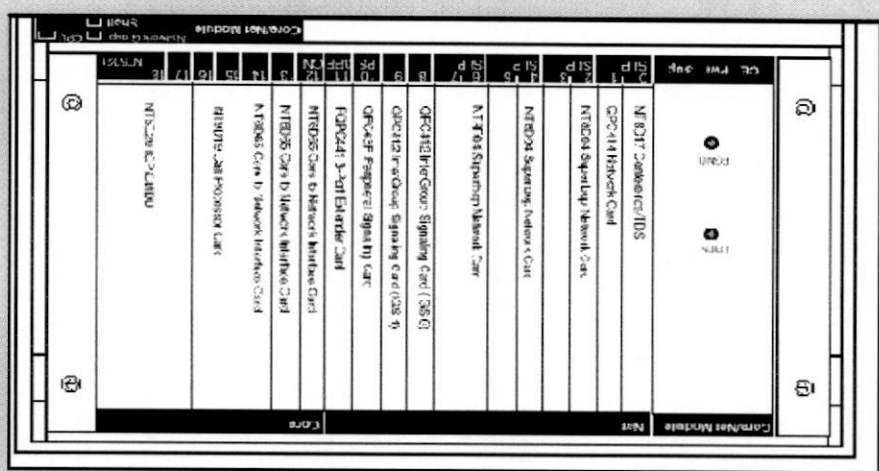


AC Ringing Generators (ACRG) are used in Intelligent Peripheral Equipment modules or Peripheral Equipment Modules. They are installed in the slot labeled Rng Gen on the left side of the module. The Ringing Generators provide 70, 80, 86 VAC at 20, 25 50 Hz used to ring 500/2500 telephones.



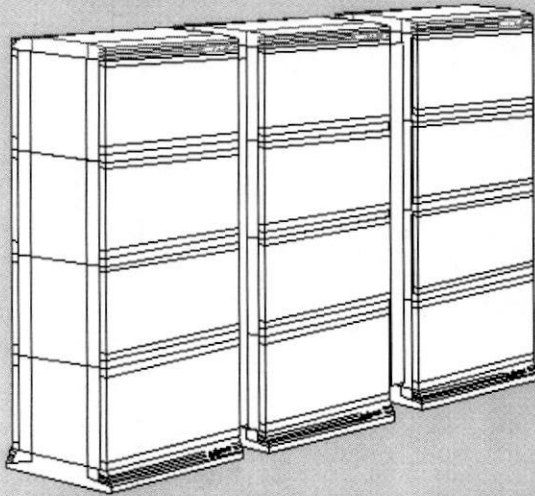
NT5D21 Core/Network Module

This module provides common control and network interface functions in options 51C, 61C, and 81C starting with X11 release 21.
 Two Core/Network Modules are required in the option 61C and 81C switch and one module is required in the option 51C. The two modules in options 61C and 81C provide redundant common control operation. If there is a failure in one of the modules, the function is transferred to the appropriate circuit cards in the other module without a loss of service.



MRP 1/2 ■ «
GK ± A ± a 1/2 » P ± « A ± ± D ■ A ± ? ■
IK ± A ± D ± 1/2 » D 1/2 ± ? 1/2 ± D « ■ ± ■ ? ■

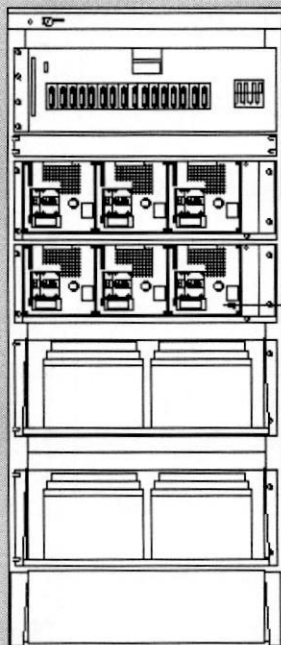
[illegible]



Option 71

DC systems can be configured as complete systems provided by Northern Telecom, or configured to connect to customer provided power plants. DC systems should be considered for:

- large systems
- systems with true long-term reserve power requirements
- when a customer has existing DC power plant or batteries available



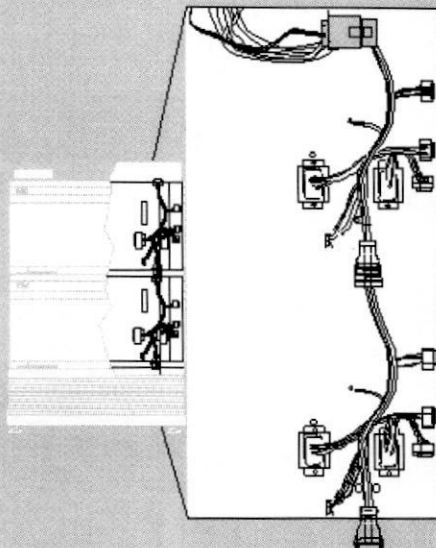
POWER SHELF

RECTIFIER

BATTERY SHELF

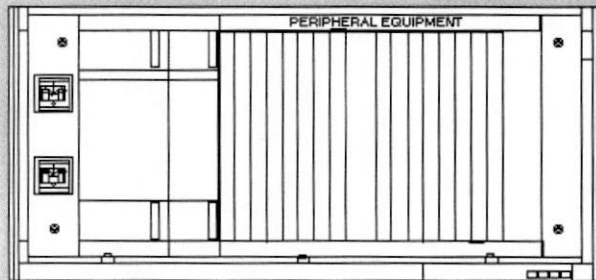
The DC powering scheme consists of an External Power Plant, Power Distribution Unit, Power Wiring Harness and DC Power Supply Converters.

The External Power Plant consists of enclosed, rack mounted rectifiers. The rectifiers convert the 208 VAC line power into -48 VDC power for the system.



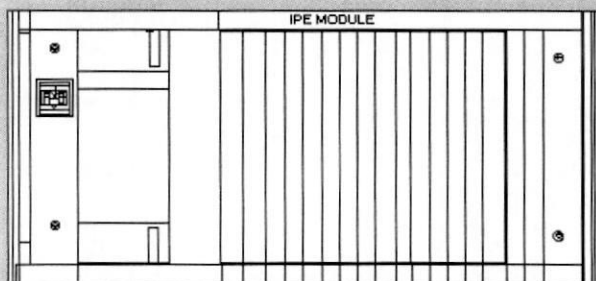
The Power Wiring Harness routes the -48 VDC from the pedestal to the modules on a power wiring harness.

This harness uses quick disconnect plugs that are attached to both the top and bottom of each module, as well as the module power supply. The connections are made via the backplane.



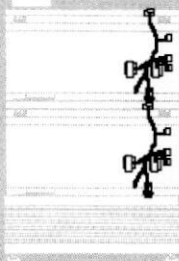
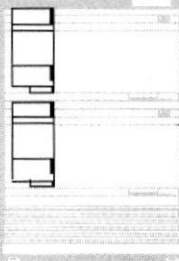
DC power supply converters convert -48 VDC into the required voltages for circuit cards receiving their power from the backplane. All DC Power Supplies are located to the left of the module, the same as AC Power Supplies. They are:

- CE Power Supply
- PE Power Supply
- CE/PE Power Supply
- DCRG Power Supply



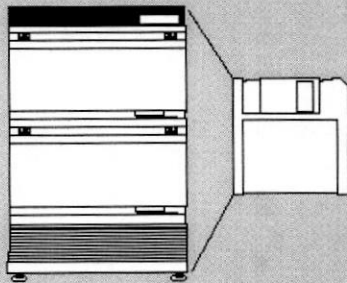


Power Equipment



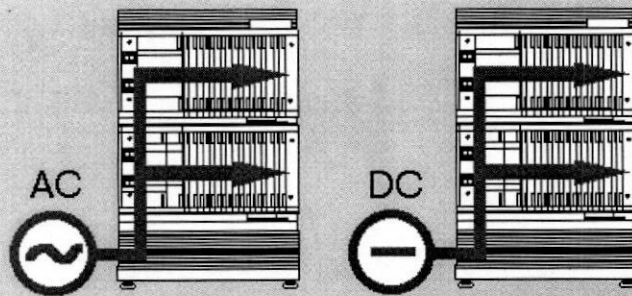
Meridian 1 features a modular power distribution architecture. As part of the modular design, the Meridian 1 power system provides:

- power supplies located in each module, rather than in separate, centralized power shelves
- a universal quick connect power wiring harness which distributes input voltages and monitor signals to the power supplies each module
- modular backup capabilities, on a per column basis.



Although AC and DC internal power components differ, they function similarly. In the AC systems, AC power is input to the pedestal and distributed to each of the module's AC/DC power supplies. In the DC systems, DC power is input to the pedestal and distributed to each of the modules DC/DC power supplies.

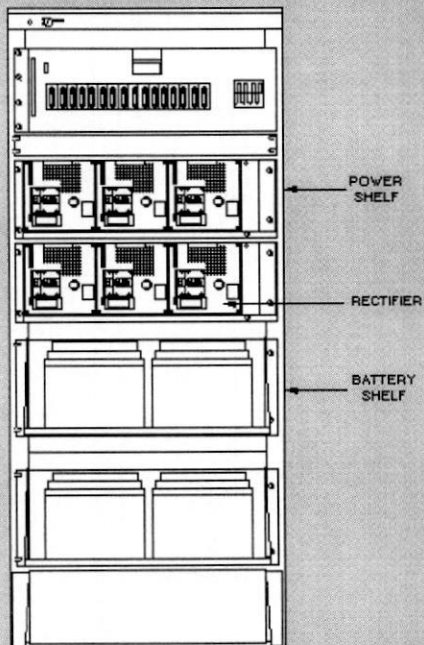
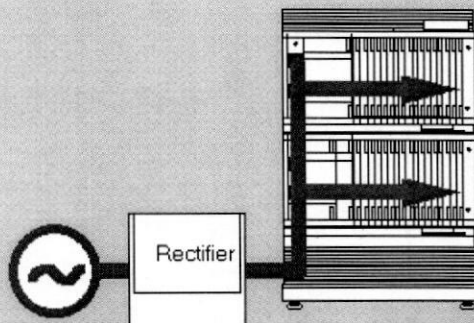
Except for the power components and the power wiring harness, all other functional elements within the system are the same for AC and DC systems.





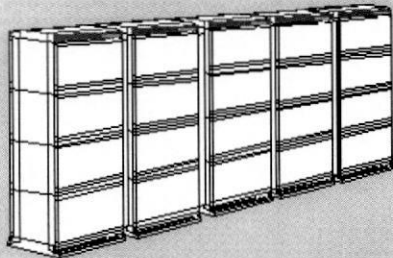
DC-Power

DC-powered systems require external rectifiers which plug into the commercial AC power source. DC powering requires a double conversion from the AC input voltage to the voltages required within the system. The rectifiers convert the AC voltage to -48V dc, which is distributed to the pedestal, then to the power supplies in the modules.

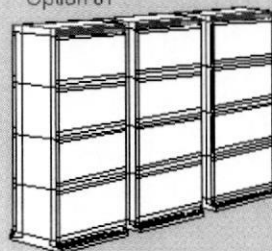


Batteries are generally used with DC-powered systems. The traditional telecommunications powering method is for the rectifiers to continuously charge a bank of batteries. However, batteries are only required if reserve power is needed.





Option 81

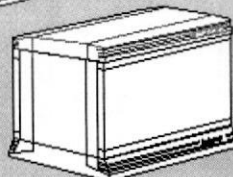
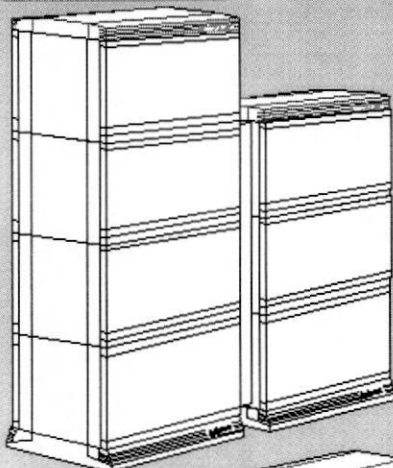


Option 71

50 AMP
Rectifier

50 AMP
Rectifier

In system Options 71 and 81 the power plant uses 50 Amp rectifiers. The number of rectifiers needed is configuration dependent.



Option 21

TEN

30 AMP
Rectifier

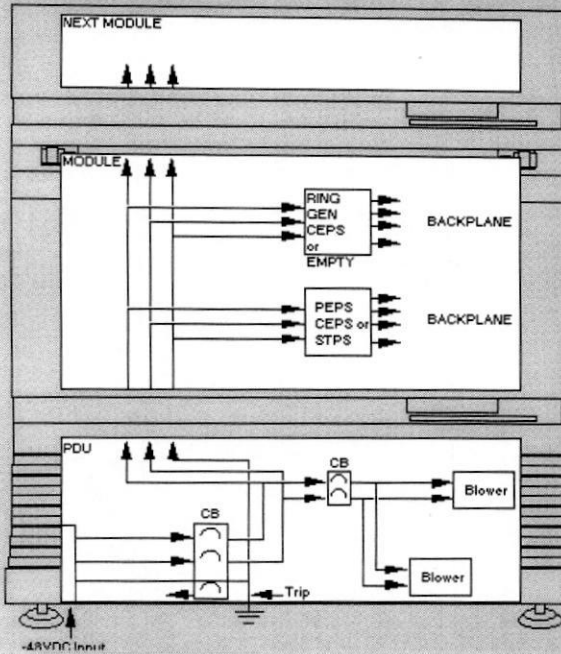
ONE

50 AMP
Rectifier

In system option 21, 21E, 51 and 61, the power plant uses 30 Amp rectifiers. The maximum number of 30 Amp rectifiers per system is six.

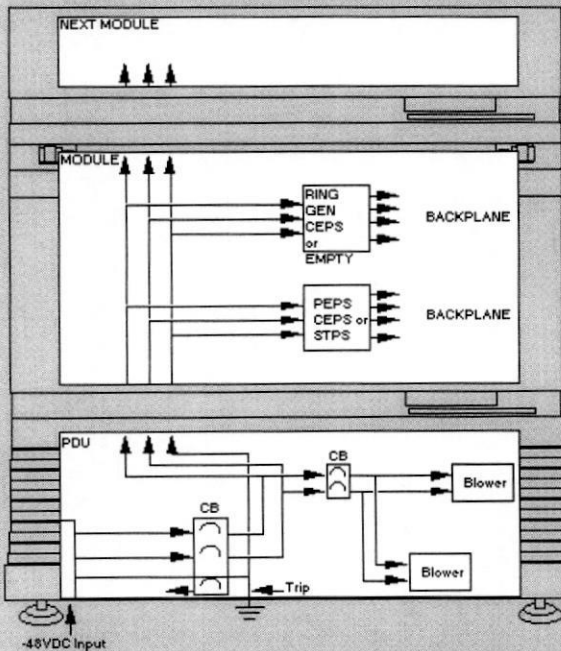
A 30 Amp rectifier can service two fully loaded modules. Thus, six rectifiers will service twelve modules.





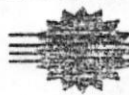
The Power Distribution Unit receives -48 VDC input at the terminal block located in the pedestal.

The -48 VDC is routed from the terminal block to five 2 pole circuit breakers. These provide surge protection for the entire column.



The power is routed from the circuit breaker to the individual module DC Power Supply Converters and to two forced air impellers (blowers).

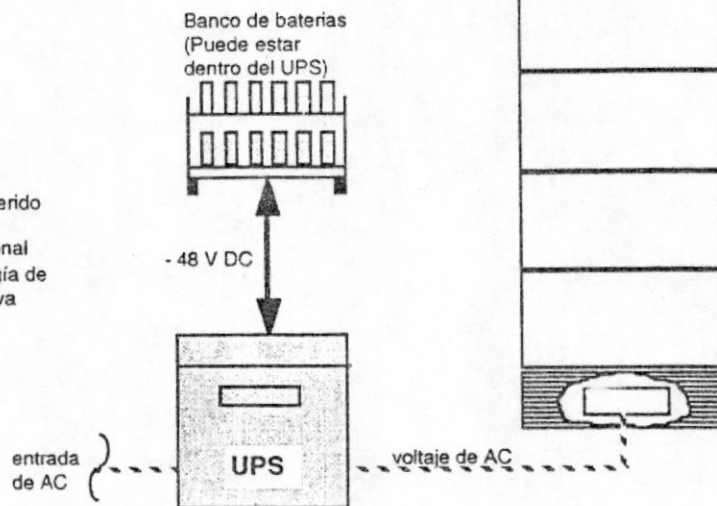
5



INTRODUCCION

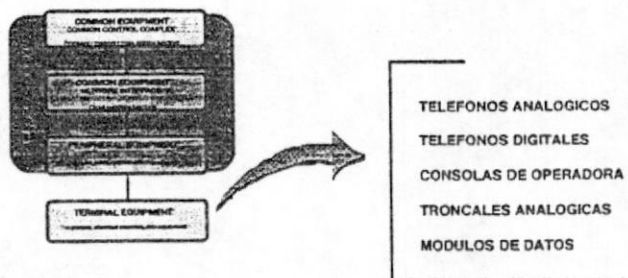
Arquitectura de alimentación externa de AC con energía de reserva

-  Requerido
-  Opcional
Energía de reserva

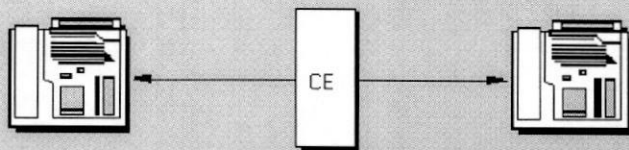


MER000.1 - #0

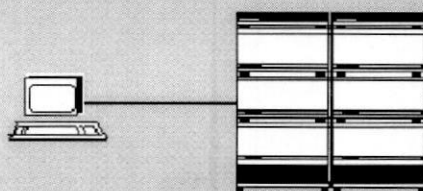
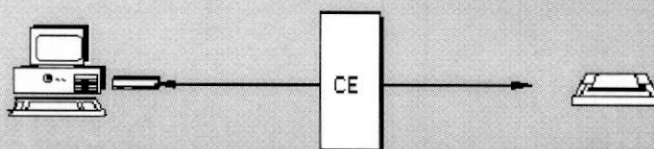
Meridian 1 Terminal Equipment



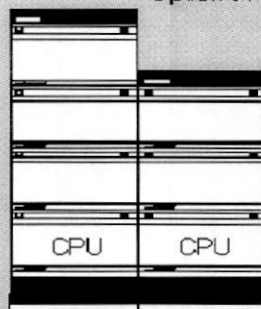
MERIDIAN 1 - 88



El equipo común provee control central para todas las conexiones de teléfonos y datos y monitorea la actividad de la llamada. También provee las funciones de administración, mantenimiento y prueba.

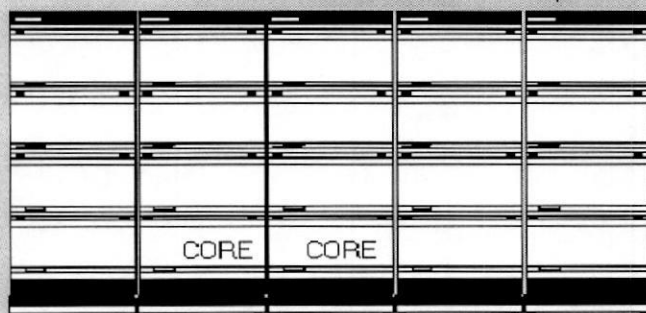


Option 61

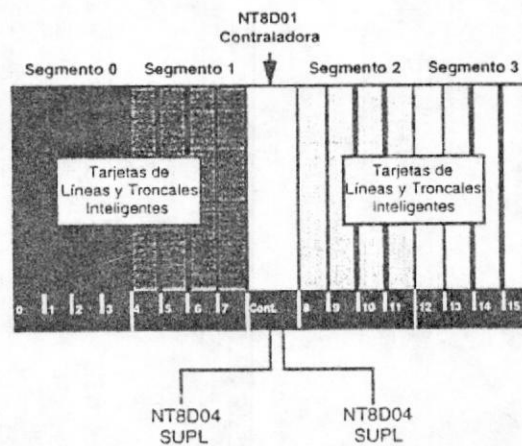


El equipo común ejecuta sus funciones usando dos principales componentes, la Unidad de Procesamiento Central (CPU) ó Módulo CORE, y la información que se encuentra almacenada.

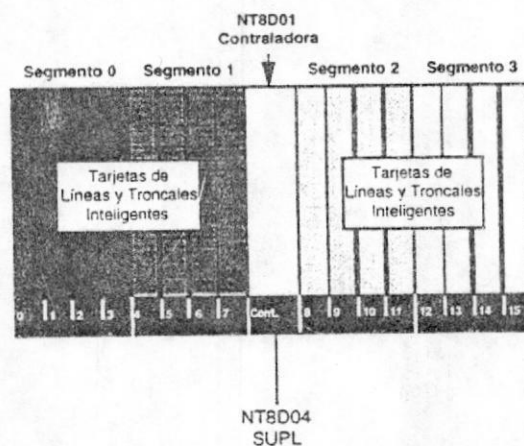
Option 81

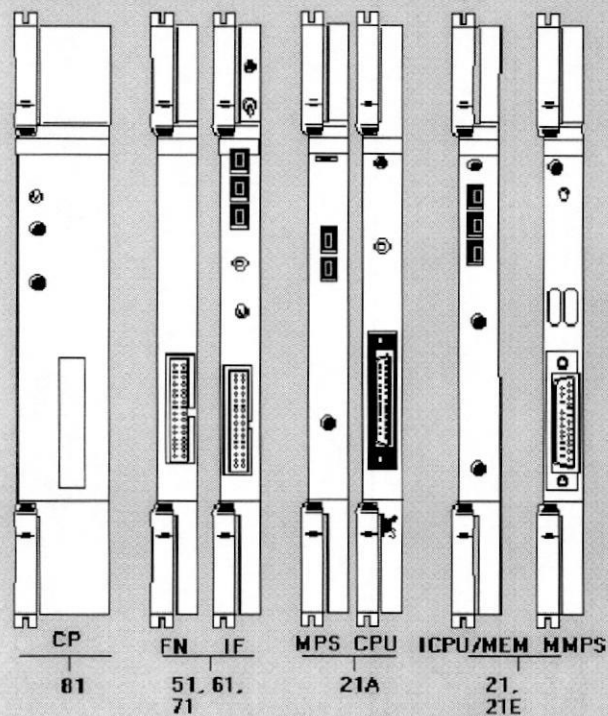


Dos Segmentos por Superloop



Cuatro Segmentos por Superloop



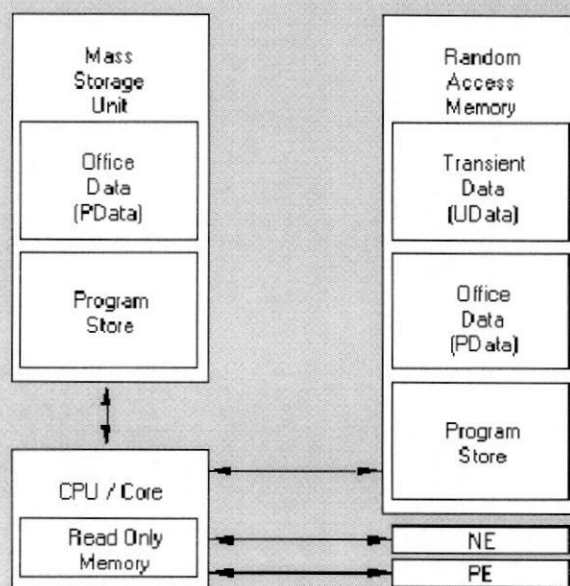


En las opciones 21 hasta 81, el CPU estaba constituido por dos tarjetas. Una tarjeta de función (FN) y una tarjeta de interface (IF).

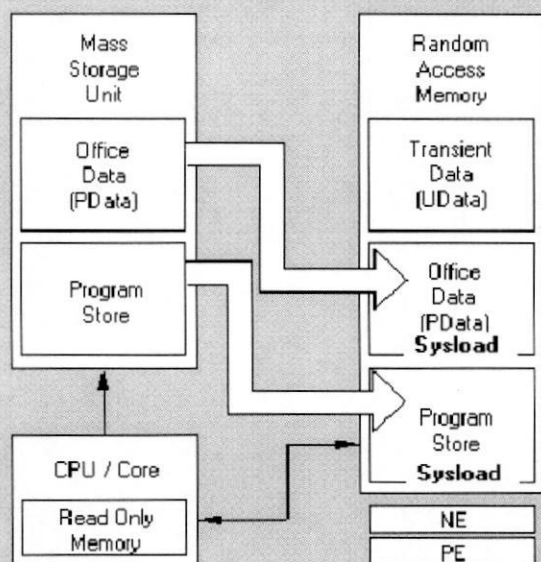


La opción 81 tiene un módulo CORE el cual ejecuta las funciones de procesamiento central para esta máquina.

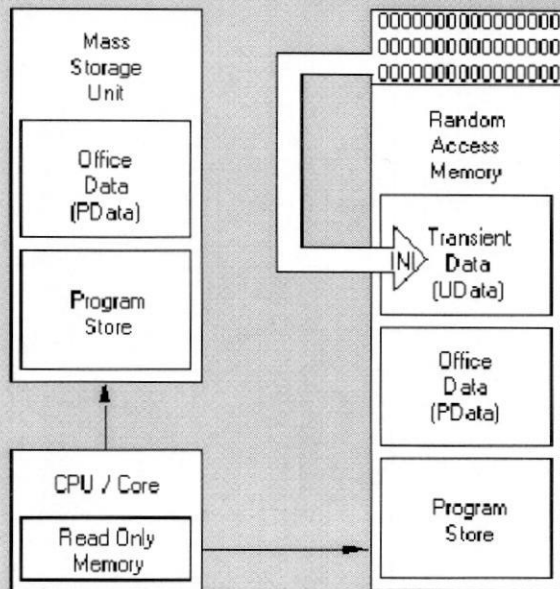
La tarjeta procesadora de llamadas (Call Processor CP) provee las funciones que realizan las tarjetas FN y IF en las plataformas anteriores.



La Unidad de Procesamiento Central ó Módulo Core direcciona todos los otros componentes del sistema tales como equipo de red y periférico. Adicionalmente, maneja la memoria del sistema y controla los aparatos de entrada/salida.

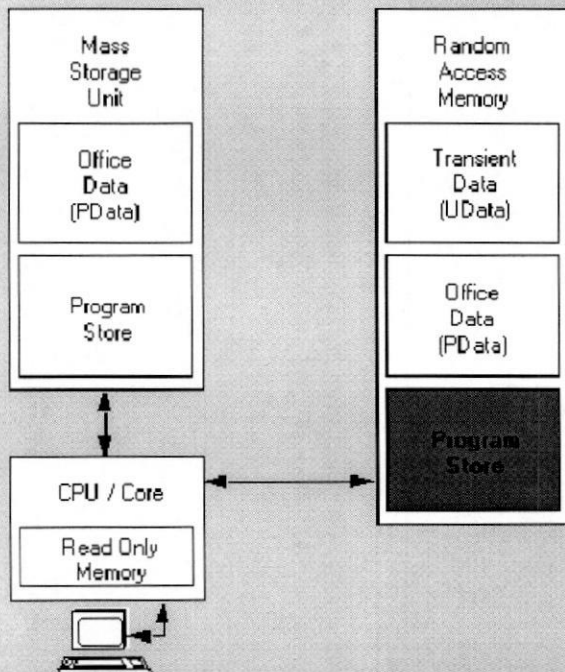


Cuando el sistema es energizado ó una recarga es requerida, una rutina conocida como **SYSLOAD** transfiere todos los datos de la oficina (office data) desde el área PDATA de la RAM. El **SYSLOAD** también transfiere los programas de procesamiento de llamadas desde **PROGRAM STORE** en la unidad de almacenamiento al área **PROGRAM STORE** en la RAM.



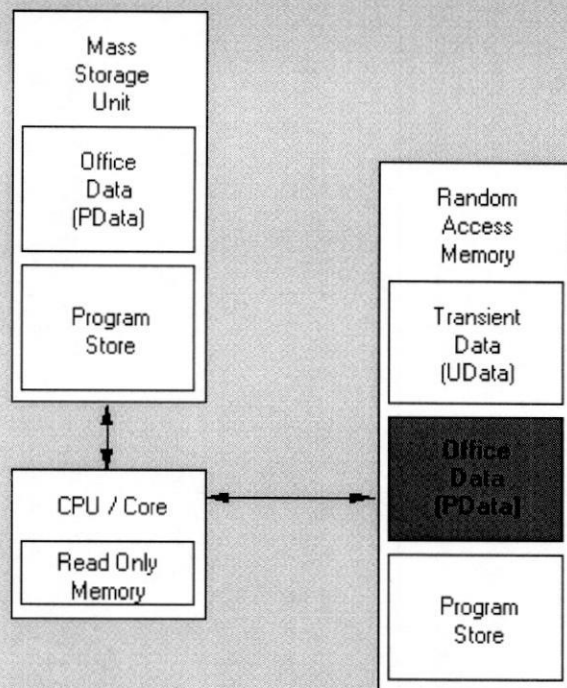
Después que el SYSLOAD se completa, un programa residente conocido como Inicialización (INI) limpia la memoria del sistema.

En sistemas redundantes, este proceso ocurre para cada CPU.



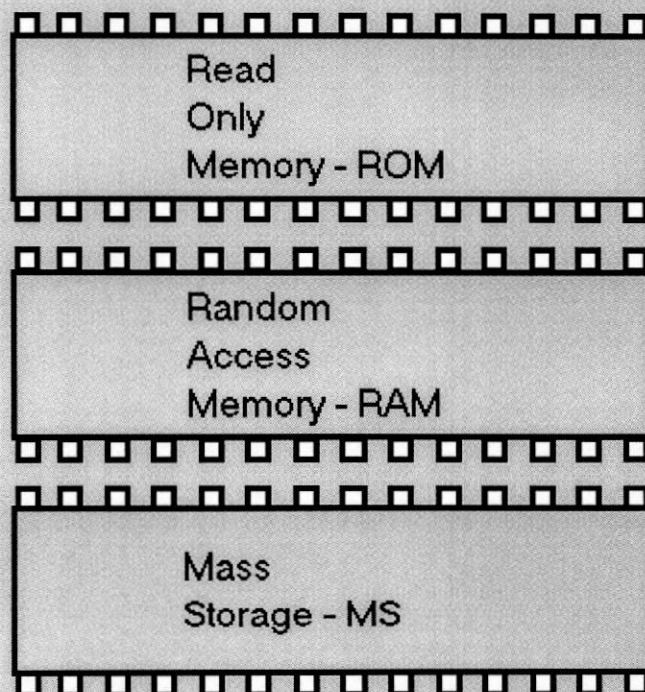
El sistema está ahora listo para ejecutar rutinas específicas tales como procesamiento de llamadas o diagnósticos de mantenimiento.

Las rutinas son programas que ejecutan una determinada función dentro del sistema. Ellos pueden ser cargados automáticamente o manualmente.



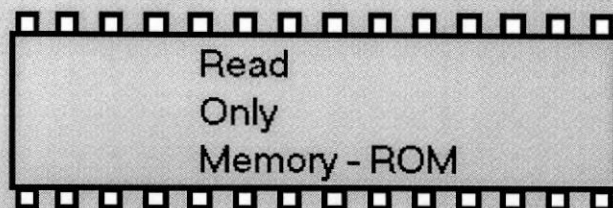
The CPU/Core executes a routine that has been loaded one step at a time.

When the routine requires system information such as customer data or trunk data, the CPU retrieves the information from the office data area (PDATA) of RAM.



The other component the Common equipment uses to perform its functions is information storage.

There are three types of information storage used in the Meridian 1 systems: Read Only Memory, Random Access Memory and Mass Storage.

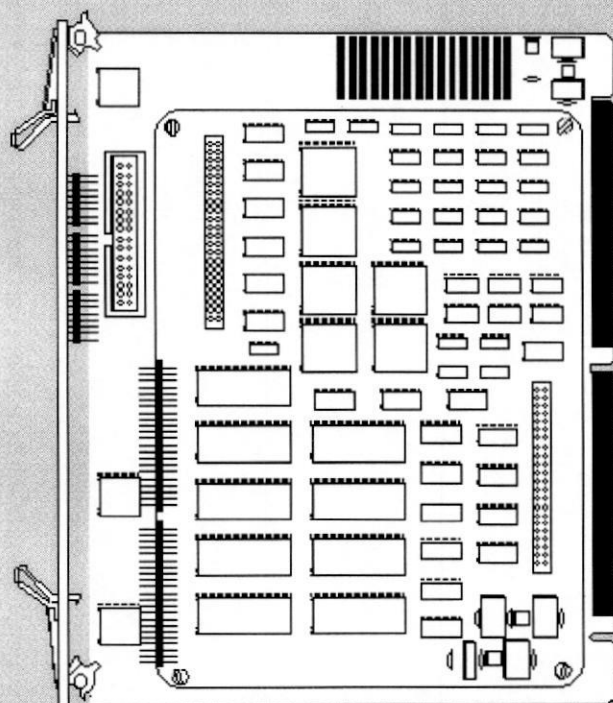


Functions:

- Stores system loading routine (SYSLOAD, INI)
- Stores system I/O control routines
- Message Retrieval Sequences

Read Only Memory (ROM) is located within the CPU.

ROM is non-volatile memory that contains the basic programs the system needs to function.



In options 21, 51, 61, and 71, the ROM circuit card is placed on the CPU Function card in a daughter board configuration.

In the Option 21E, the ROM daughter board is located on the Integrated CPU/6 Mbyte Memory card (ICM).

The Call Processor card in the Option 81 does not require a daughter board configuration to provide ROM to the system.

UDATA	PDATA	Program Store
- Transient Data - Stores all transient data such as call connections and idle/busy status of all sets. Known as system scratch pad.	- Office Data - Stores all information on features and services defined for a customer. Such as features associated with each Key on a telephone.	- Operating Programs - Programs required for communications with ROM Overlay area that contains one overlay program at a time, as needed. Call processing Programs

Random Access Memory (RAM) is volatile memory that is used by the system as a work area.

RAM is divided into three areas: UDATA, PDATA and Program Store.



The Option 21 combines the functionality of the memory and peripheral signaling circuit cards, as well as some CPU functions, onto one Memory/Peripheral Signaling circuit card. On this card is where RAM functions take place.



The Option 21E houses its RAM functions on the Integrated CPU/6 Mbyte Memory circuit card (ICM) along with several other CPU functions.



Options
51 & 61

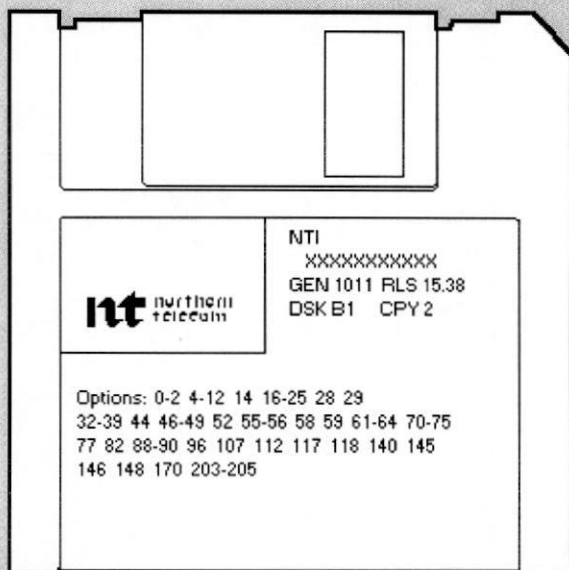


Option 71

Options 51, 61, and 71 house their RAM on 6 Mbyte Memory circuit cards. In Options 51 and 61, there is a maximum of one 6 Mbyte Memory circuit card per CPU, while in the Option 71 the maximum is two.

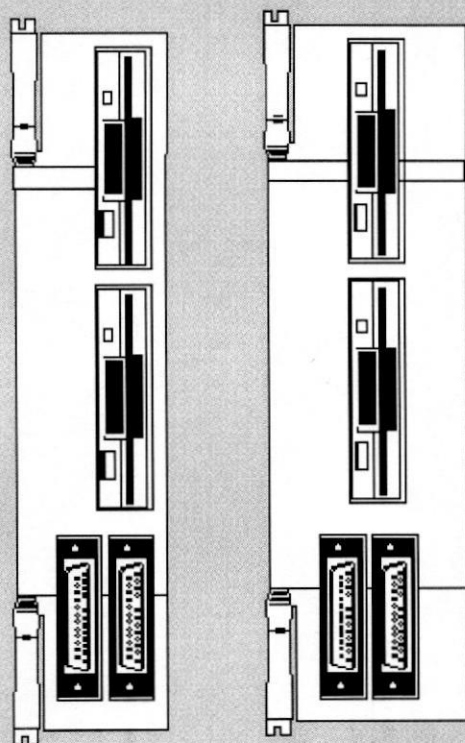


CIC
In the Option 81 a single Call Processor card houses 16 Mbytes of memory. This memory portion is designed to accommodate six commercial Single In-line Memory Modules (SIMMS) for a potential capacity of 96 Mbytes if 16 Mbyte SIMMS are used.



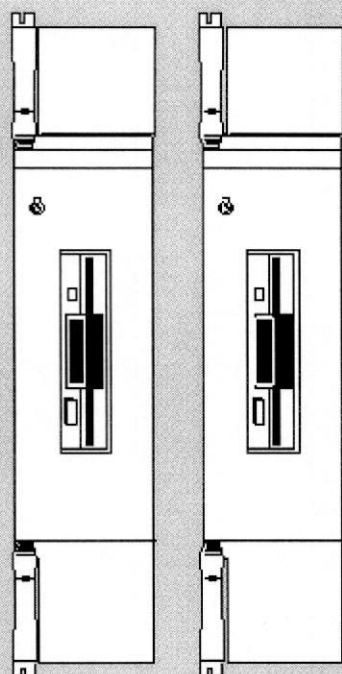
Mass Storage provides a non-volatile back-up for RAM.

Maintenance diagnostics are stored on and retrieved from Mass Storage when they are needed.



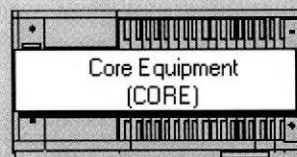
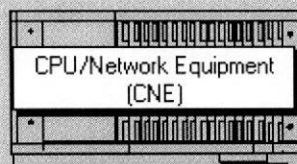
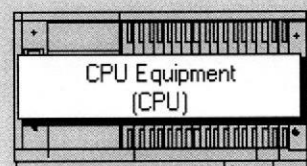
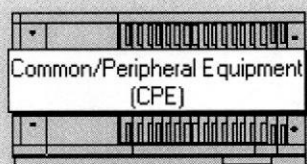
There are two types of Mass Storage Units available: a Floppy Disk Unit (FDD) or a Floppy Disk Unit with a Hard Drive, called a Multi-Disk Unit (MDU).

Options 21A, 21 and 21E are equipped with an FDD. The Option 51, 61 and 71 with X11 software release 18 and later require the MDU.

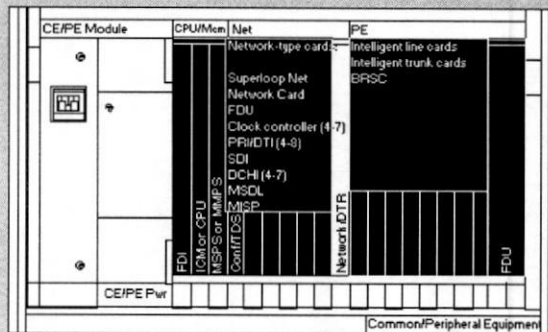


The Option 81 has two Core Multi-Disk Drive Units (CMDU). Each contains a 120 Mbyte hard disk and a single 4 Mbyte floppy unit.

Only 120 Mbyte is available for mass storage purposes since the two hard disks are used in a redundant arrangement for added reliability.



CPE Module

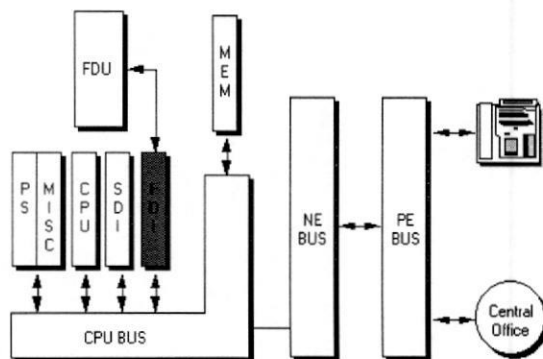


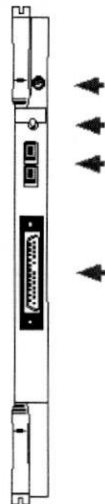
The Common/Peripheral Equipment modules provide CPU control, network switching, and peripheral equipment interface functions in Options 21A, 21 and 21E. One CPE module is used in each system.

Floppy Disk Interface (FDI):

This card interfaces the Floppy Disk Unit and the CPU.

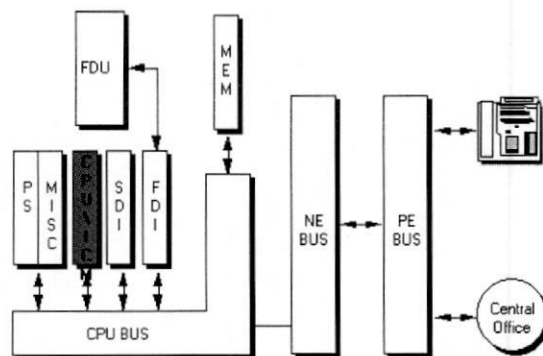
It provides address matching, disk drive control, data buffering and interrupt and control circuits.





Faceplate feature of the FDI are:

- Red LED: When lit this LED indicates the card is inactive or faulty.
- ENB/DIS switch: Used to manually hardware enable or disable the card.
- Two Digit Maintenance display: Indicates the status of the Floppy Disk Unit.
- One Cable Jack: Used to connect the FDI with the Floppy Disk Unit.



CPU/ICM:

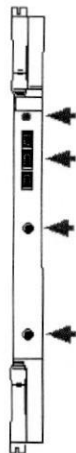
The CPU card contains the main circuitry for the CPU which provides arithmetic/logical functions, instruction decoding and system code timing.

The ICM card in the Option 21E contains CPU logic circuitry, interrupt control, fault monitoring, real time clock and 6 Mbytes of RAM.



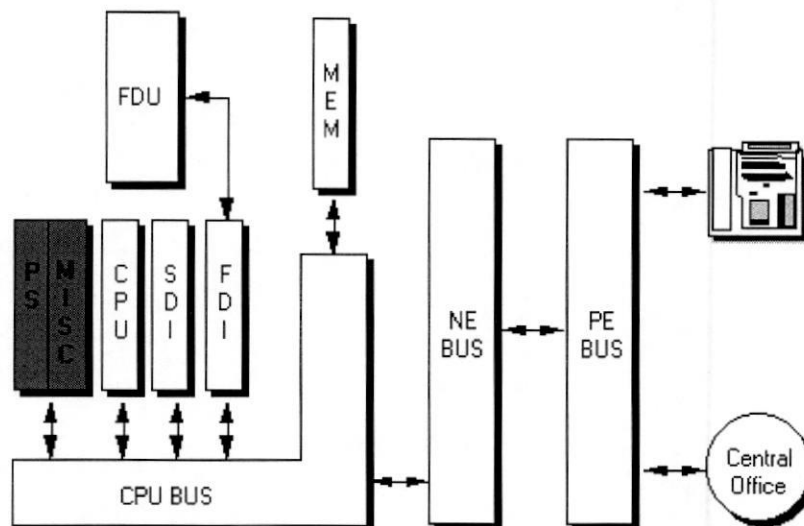
Faceplate features of the CPU card are:

- Red LED: When lit, this LED indicates the card is inactive or faulty.
- RLD Button: Used to manually invoke a system reload.
- One Cable Jack: Connects to the I/O panel for external communication such as a system terminal.



Faceplate features of the ICM card in the Option 21E are:

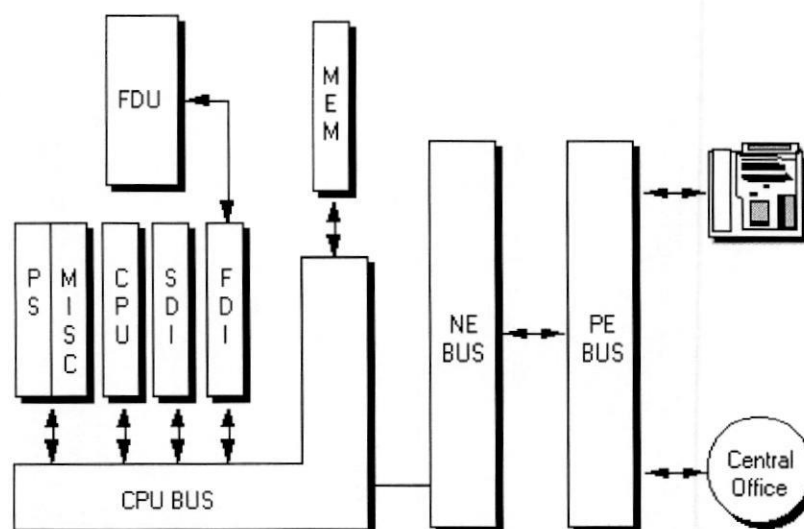
- Red LED: When lit, this LED indicates the card is inactive or faulty.
- Three Digit Maintenance display: Indicates system faults.
- INI Button: Used to manually invoke the Initialization (INI) Routine.
- RLD Button: Used to reload the switch



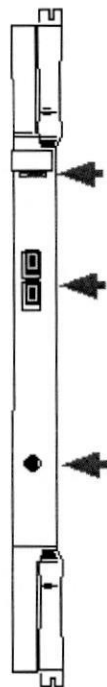
Memory Peripheral Signaling (MMPS):

This card combines the functionality of the memory and peripheral signaling cards as well as miscellaneous CPU functions. The CPU functions include interrupt and fault monitoring. The peripheral signaling functions include signaling interface between the CPU and peripheral equipment for up to 28 network loops and clock and timing signals for real-time transmission functions.

This card is used in the Options 21A and 21.

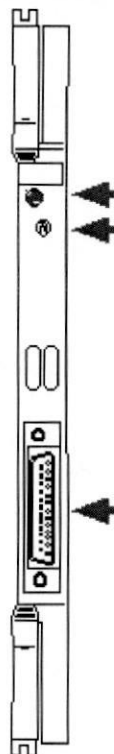


The Misc./SDI/Peripheral Signaling card is used in the Option 21E. This card provides miscellaneous CPU functions, two SDI ports, a battery pack that provides CPU memory backup for a maximum of 60 min., and peripheral signaling interfaces similar to those provided by the MMPS card used in the Options 21A and 21.



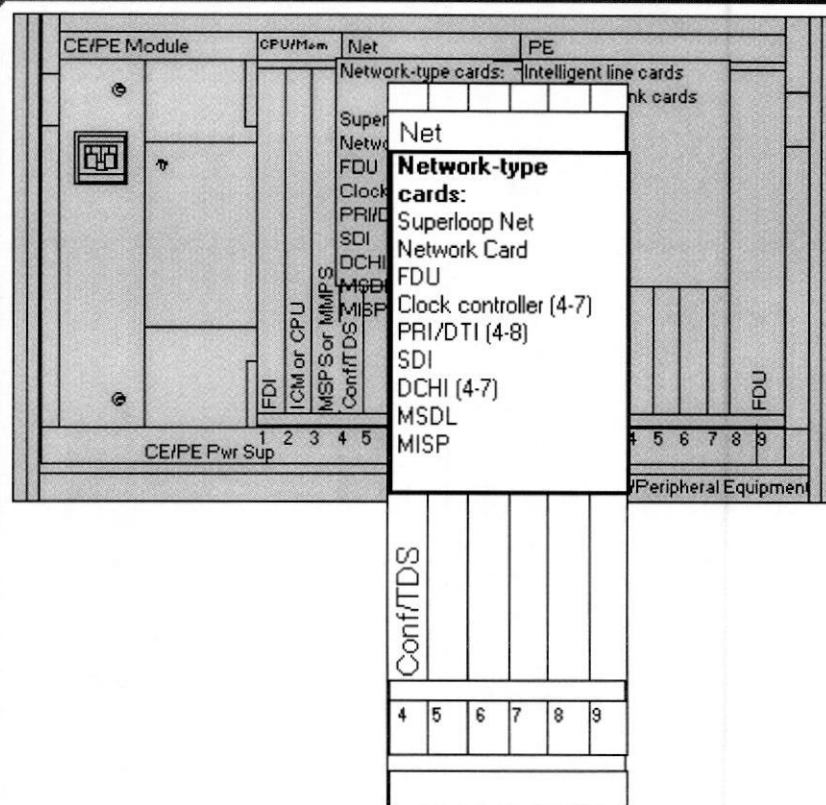
Faceplate features of the Memory/Peripheral Signaling Card (MMPS) are:

- Red LED: When lit, this LED indicates that this card or some other component in the system is faulty.
- Two Digit Maintenance display: Indicates system faults.
- INI Button: Used to manually invoke the Initialize (INI) Routine.

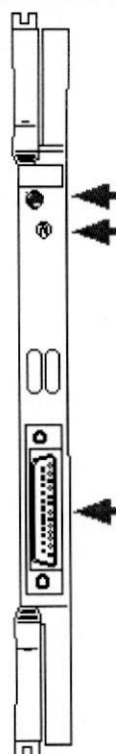


The Faceplate features of the Misc./SDI/Peripheral Signaling card are :

- Red LED: When lit, this LED indicates that that least one I/O port is disabled.
- ENB/DIS switch: Used to manually hardware enable or disable the card.
- One Cable Jack: With an octopus cable, used to provide two SDI ports. Can connect directly to a TTY or I/O panel.

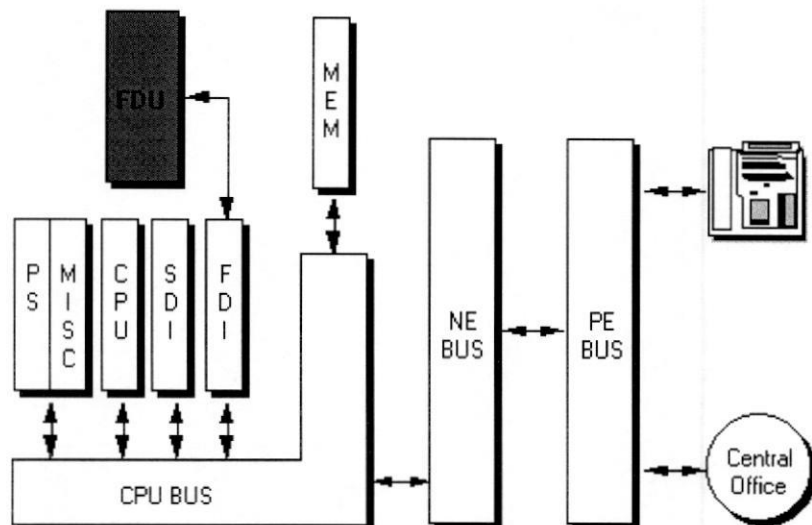


The circuit cards located in slots 4 through 10 of the CPE Module are associated with Network equipment. Slots 4 through 9 can have various functions, card slot 10 is a dedicated superloop.



The Faceplate features of the Misc./SDI/Peripheral Signaling card are :

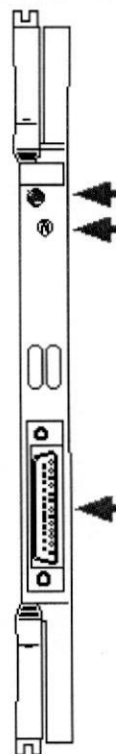
- Red LED: When lit, this LED indicates that at least one I/O port is disabled.
- ENB/DIS switch: Used to manually hardware enable or disable the card.
- One Cable Jack: With an octopus cable, used to provide two SDI ports. Can connect directly to a TTY or I/O panel.



Floppy Disk Unit (FDU):

The FDU is used to load system software, overlay programs and office data into the system memory.

The FDU contains two 3.5 inch floppy disk drives.

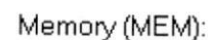


The Faceplate features of the Misc./SDI/Peripheral Signaling card are :

- Red LED: When lit, this LED indicates that at least one I/O port is disabled.
- ENB/DIS switch: Used to manually hardware enable or disable the card.
- One Cable Jack: With an octopus cable, used to provide two SDI ports. Can connect directly to a TTY or I/O panel.

Two CPU modules provide CPU control in the Option 71. Card slots 1 - 15 house common equipment cards.

CE Module			CPU/Mem														
			Memory Card	Memory Card	CMIA	CPU Interface	CPU Function	SDI	FDI	Segmented Bus Extender1	Segmented Bus Extender1	Segmented Bus Extender1	Segmented Bus Extender1	Segmented Bus Extender1	SDI	Clock Controller	FDU, MDU, or PRINDT
CE Pwr Sup																	
Common Equipment																	



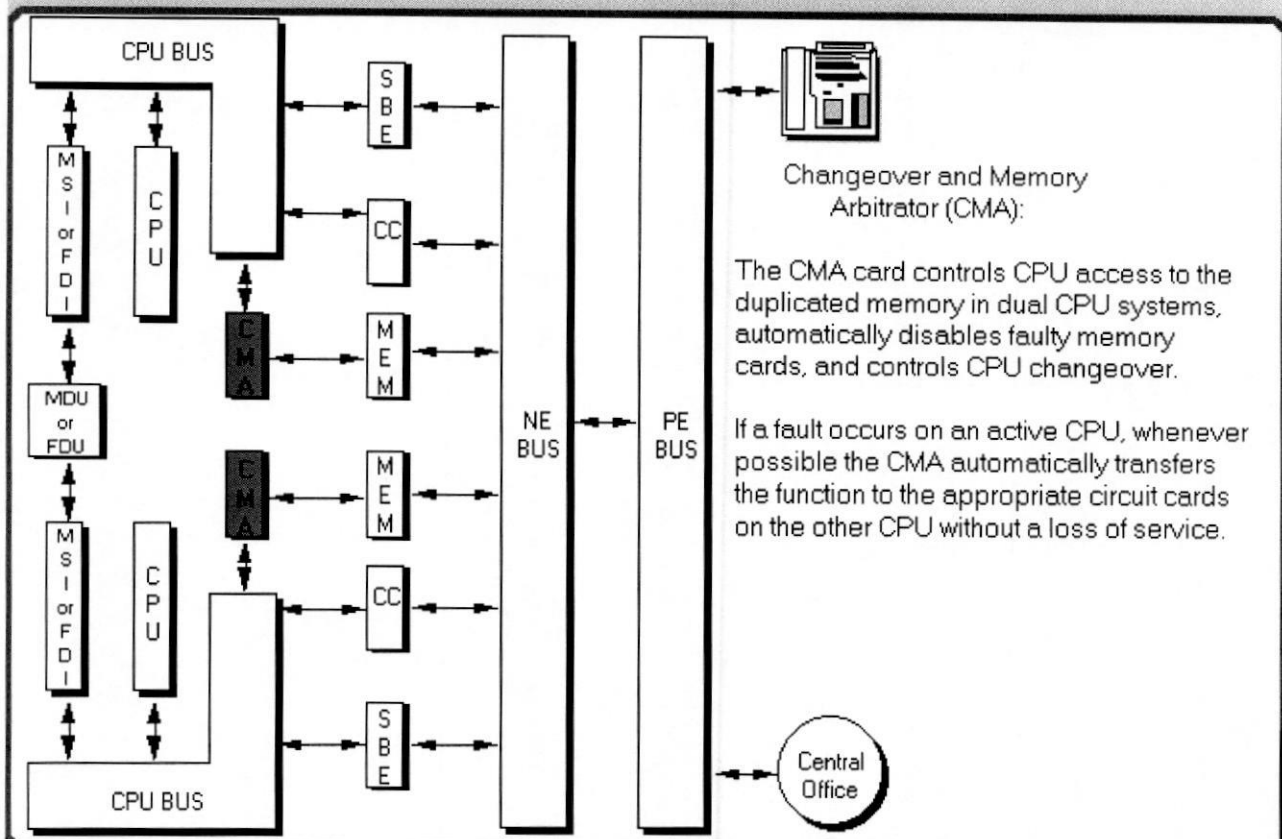
Using the two card slots available, the Option 71 can provide 12 Mbytes of memory.

Memory cards cannot be mixed. Two of the newer 6 Mbyte cards must be used, or 2 of the older 768K cards can be used, prior to X11 software release 18, but they cannot be mixed.



Faceplate features of the MEM card are:

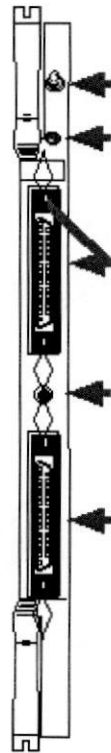
- Red LED: When lit, this LED indicates the card is inactive or faulty.



Changeover and Memory Arbitrator (CMA):

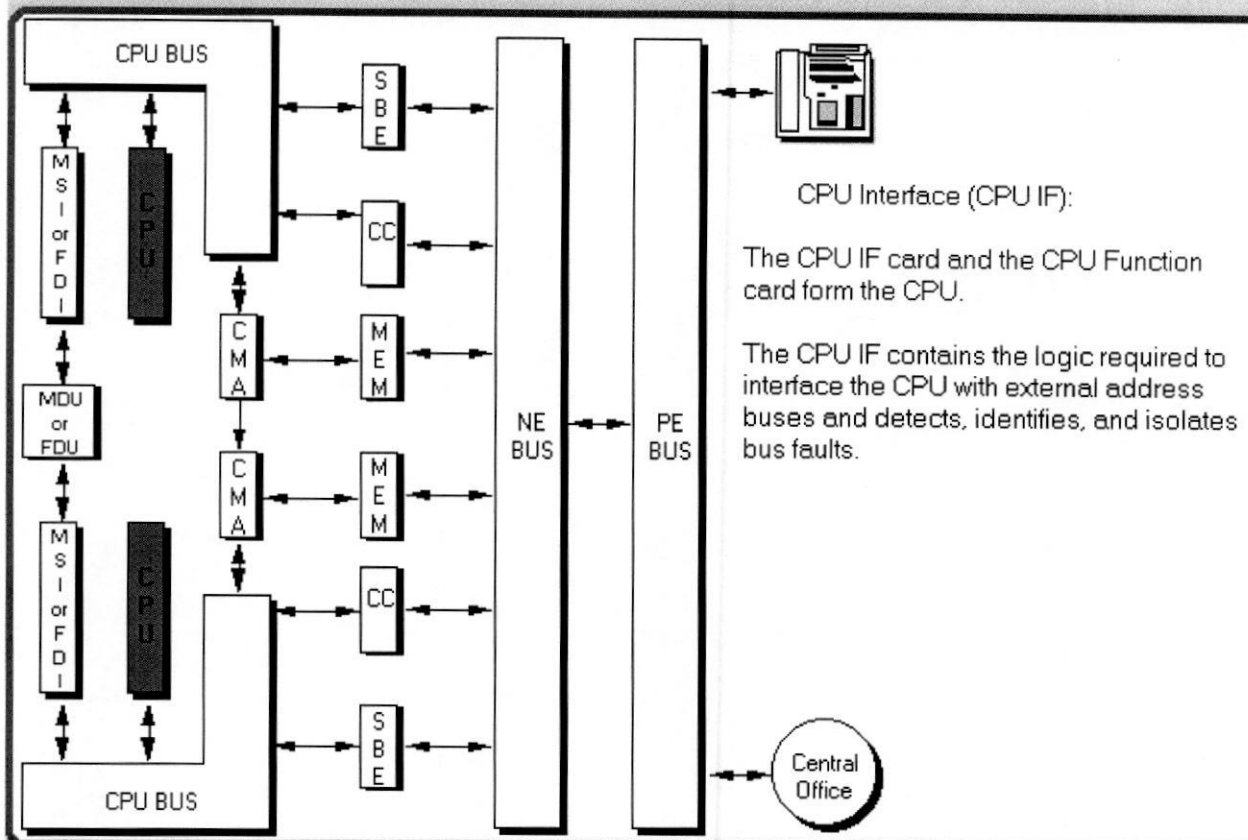
The CMA card controls CPU access to the duplicated memory in dual CPU systems, automatically disables faulty memory cards, and controls CPU changeover.

If a fault occurs on an active CPU, whenever possible the CMA automatically transfers the function to the appropriate circuit cards on the other CPU without a loss of service.



Faceplate features of the CMA are:

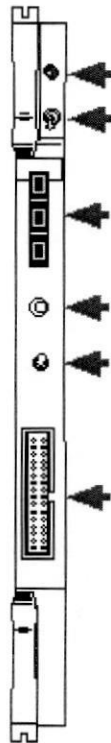
- Red LED: When lit, this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Two Cable Jacks: Used to connect the CMA's together.
- RLD Button: Used to manually invoke a system reload. The reload buttons on both CMA cards must be pushed simultaneously.



CPU Interface (CPU IF):

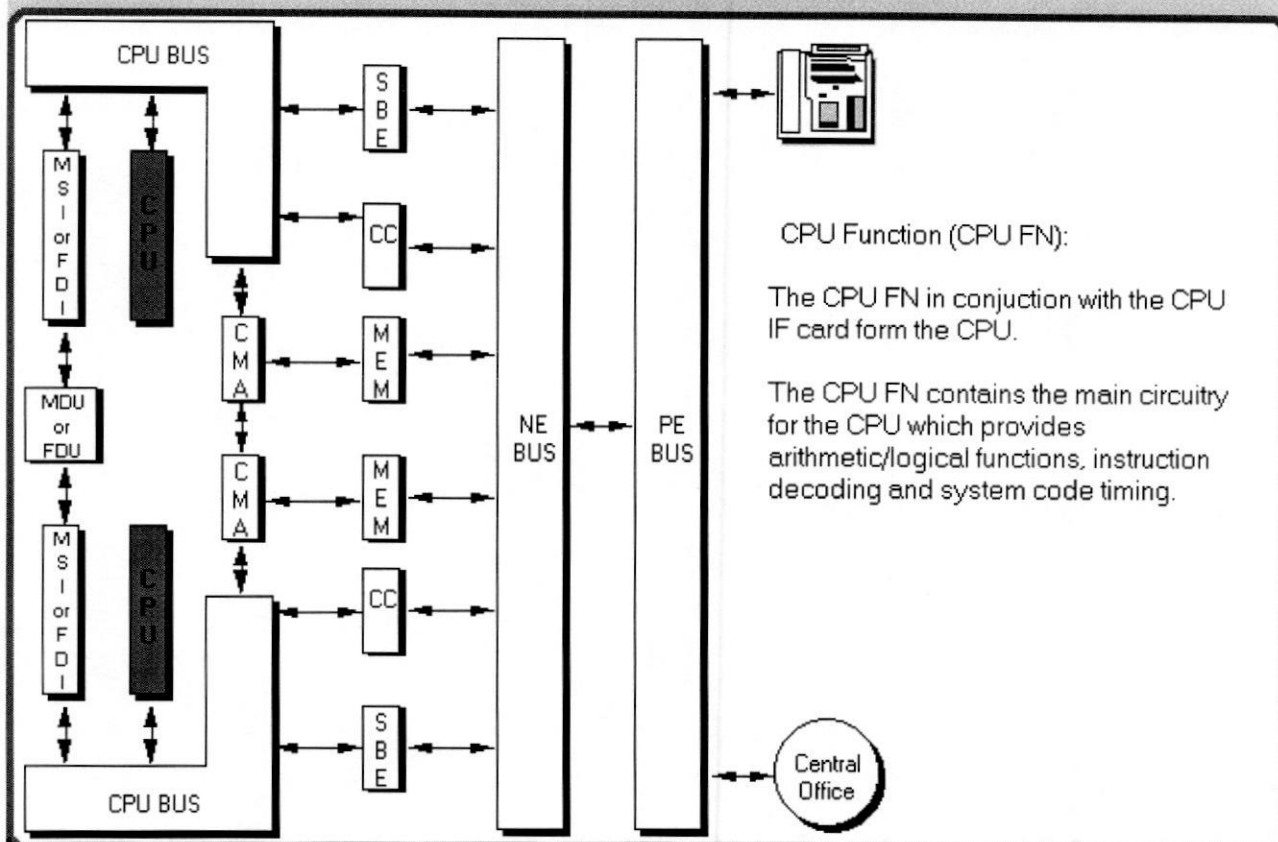
The CPU IF card and the CPU Function card form the CPU.

The CPU IF contains the logic required to interface the CPU with external address buses and detects, identifies, and isolates bus faults.



Faceplate features of the CPU IF are:

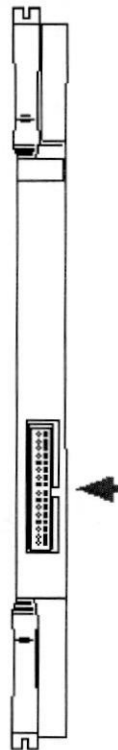
- Red LED: When lit, this LED indicates the CPU is in Standby mode.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Three Digit Maintenance display: Indicates the Common Equipment faults.
- INI Button: Used to manually invoke the Initialize (INI) Routine.
- NORM/MAINT switch: Used to prevent a CPU swap.
- One Cable Jack: Connects to the CPU FN card.



CPU Function (CPU FN):

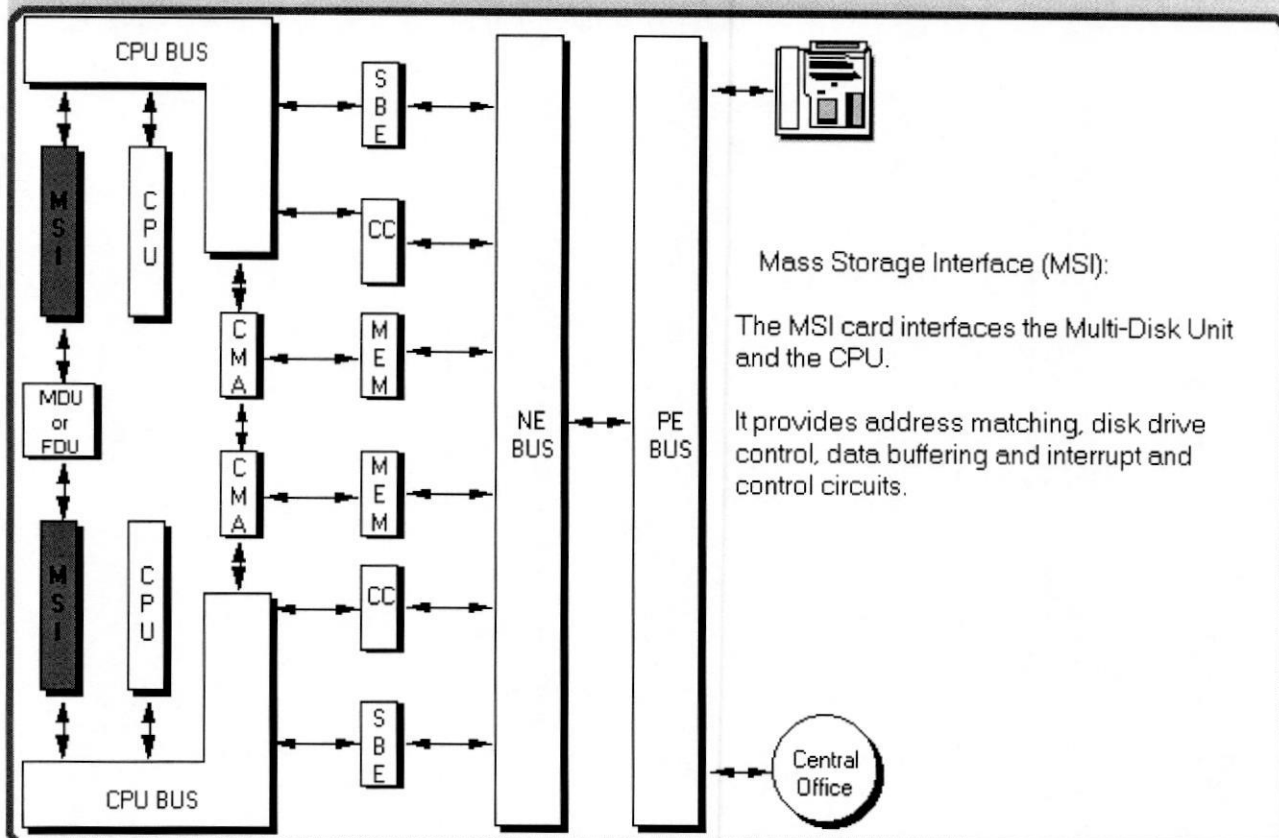
The CPU FN in conjunction with the CPU IF card form the CPU.

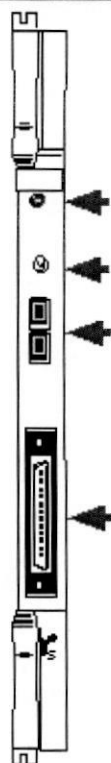
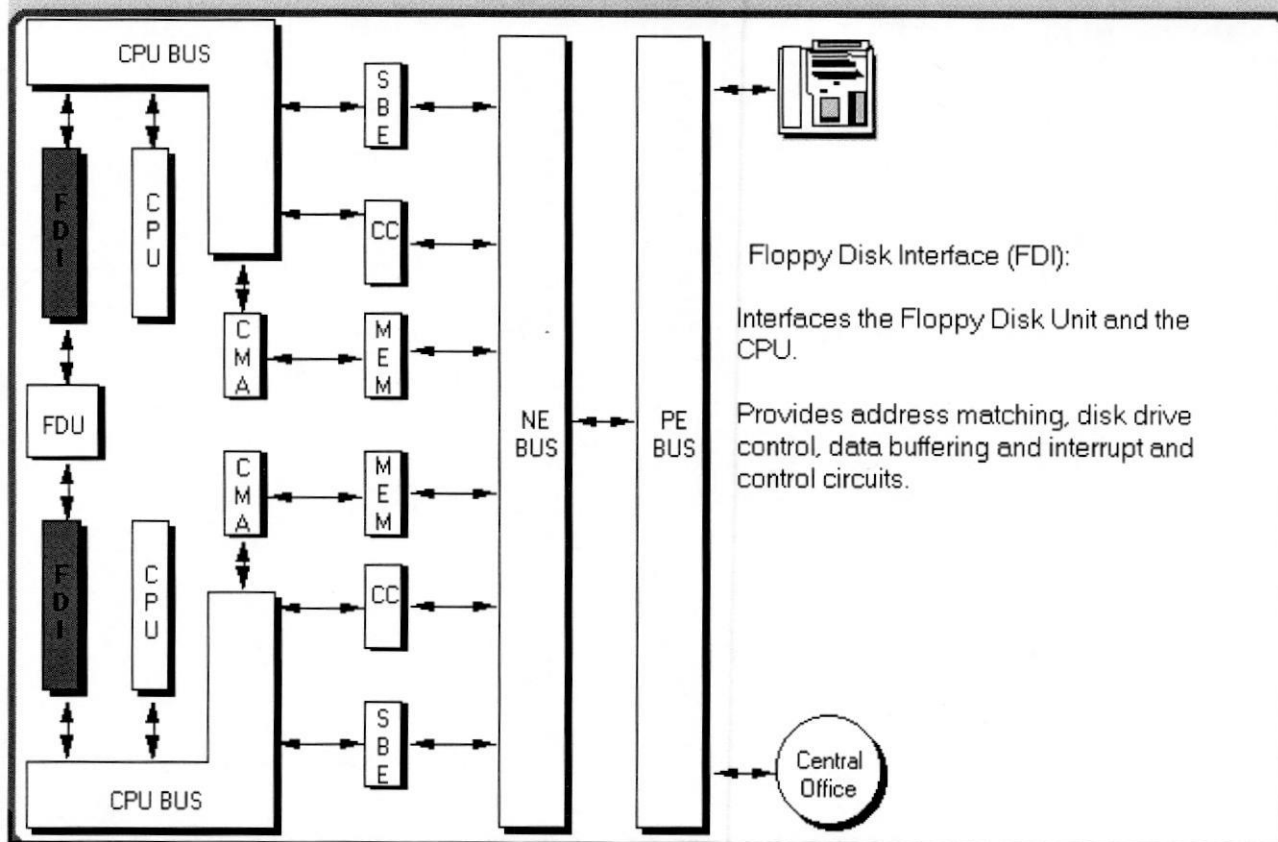
The CPU FN contains the main circuitry for the CPU which provides arithmetic/logical functions, instruction decoding and system code timing.



Faceplate features of the CPU FN are:

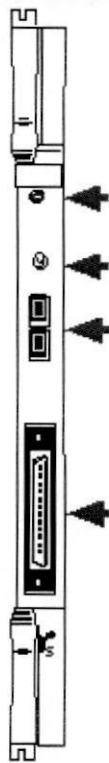
- One Cable Jack: Connects to the CPU IF card.





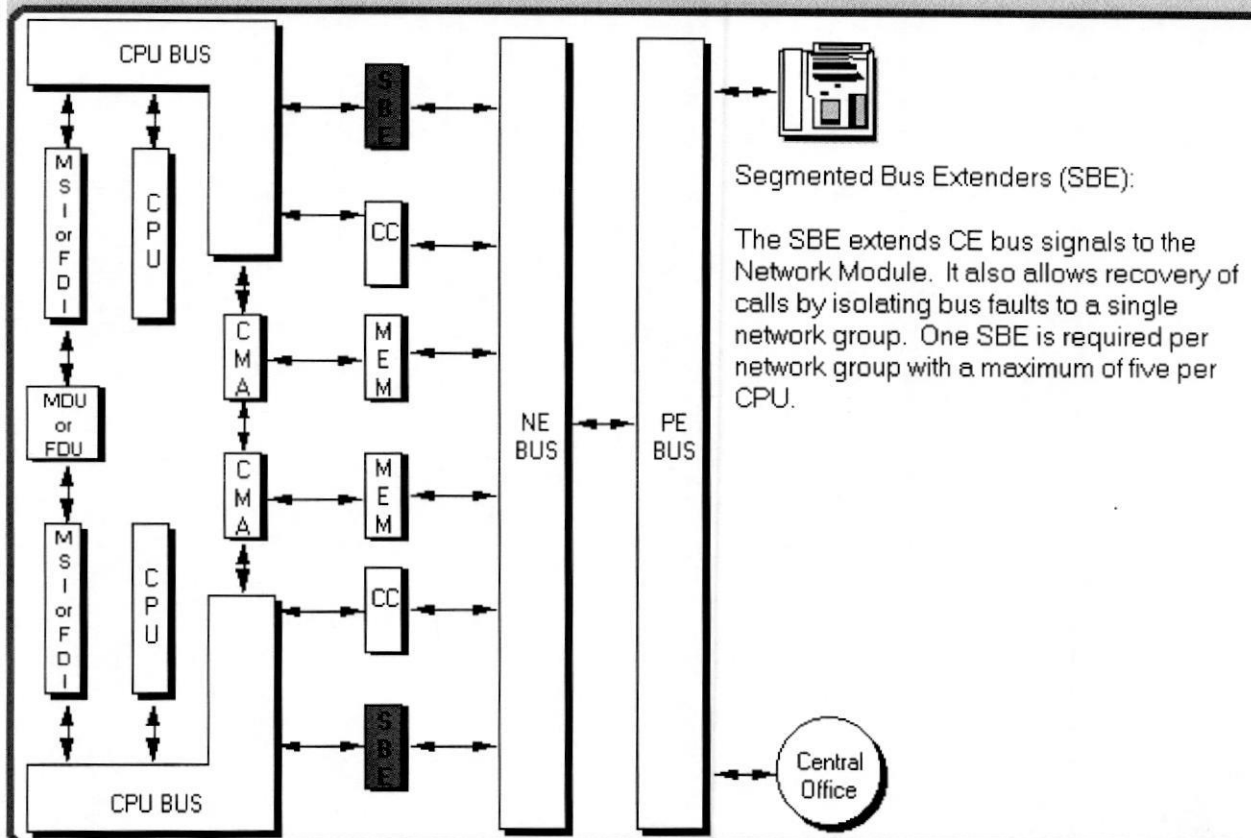
Faceplate features of the MSI are:

- Red LED: When lit, this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Two Digit Maintenance display: Indicates the status of the Multi-Disk Unit.
- One Cable Jack: Used to connect the MSI with the Multi-Disk Unit.



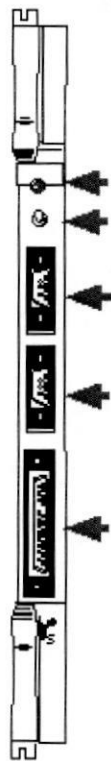
Faceplate features of the MSI are:

- Red LED: When lit, this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Two Digit Maintenance display: Indicates the status of the Multi-Disk Unit.
- One Cable Jack: Used to connect the MSI with the Multi-Disk Unit.



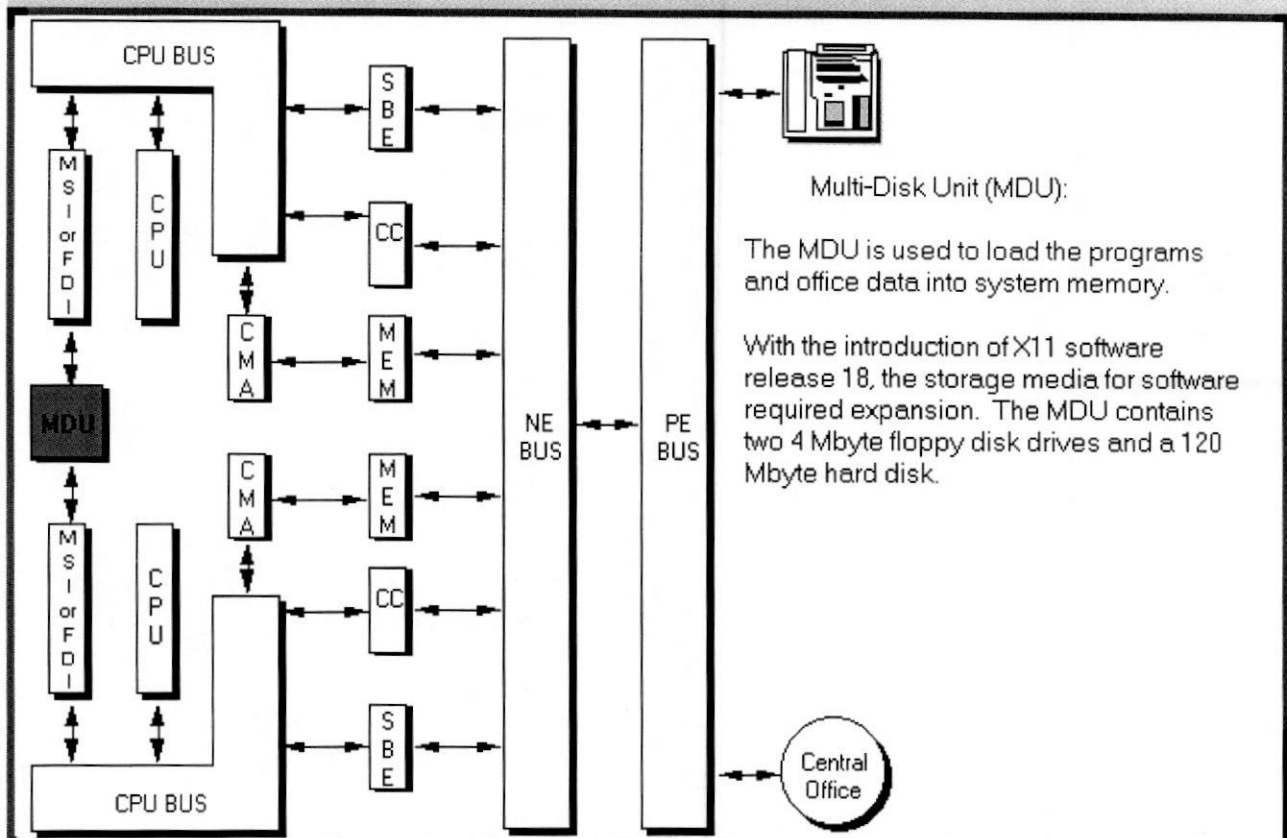
Segmented Bus Extenders (SBE):

The SBE extends CE bus signals to the Network Module. It also allows recovery of calls by isolating bus faults to a single network group. One SBE is required per network group with a maximum of five per CPU.



Faceplate features of the CC are:

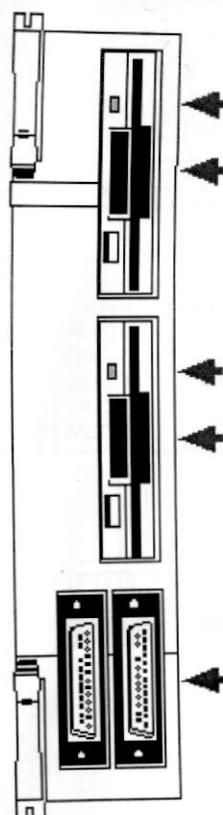
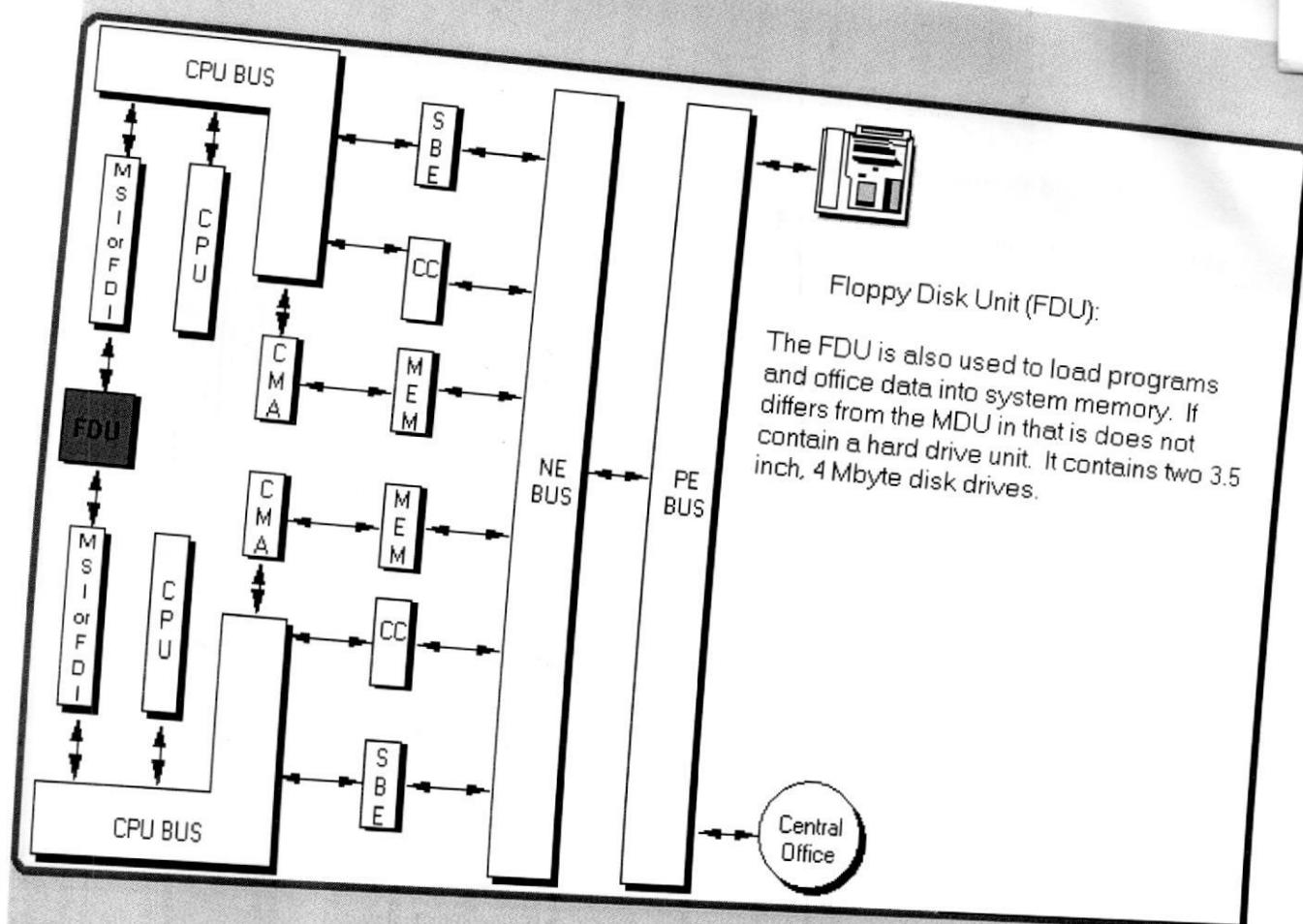
- Red LED: When lit, this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Three Cable Jacks: If a DTI/PRI card is used, the top two jacks are used to connect the CC to the DTI/PRI card. The third jack is used to connect to another CC in Option 61 and Junctor 11 or 12 in Option 71.



Multi-Disk Unit (MDU):

The MDU is used to load the programs and office data into system memory.

With the introduction of X11 software release 18, the storage media for software required expansion. The MDU contains two 4 Mbyte floppy disk drives and a 120 Mbyte hard disk.



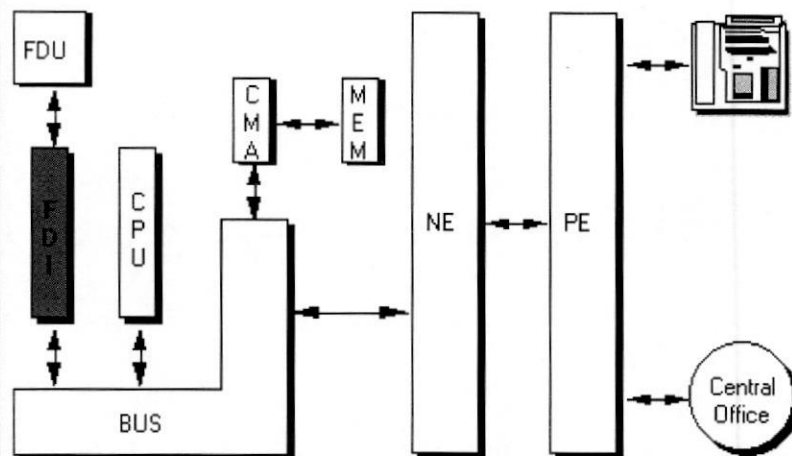
The MDU and FDU have the same faceplate features, the only difference being the physical size. They are:

- Two 3.5 inch floppy drive units: They are controlled by the FDI and have a format capacity of 4 Mbytes each.
- Two green LEDs (one per drive unit): When lit, indicates the disk is being accessed.
- Two Cable Jacks: Used to connect the FDU to the FDI, or the MDU to the MSI.

Floppy Disk Interface:

The FDI card interfaces the Floppy Disk Unit and the CPU.

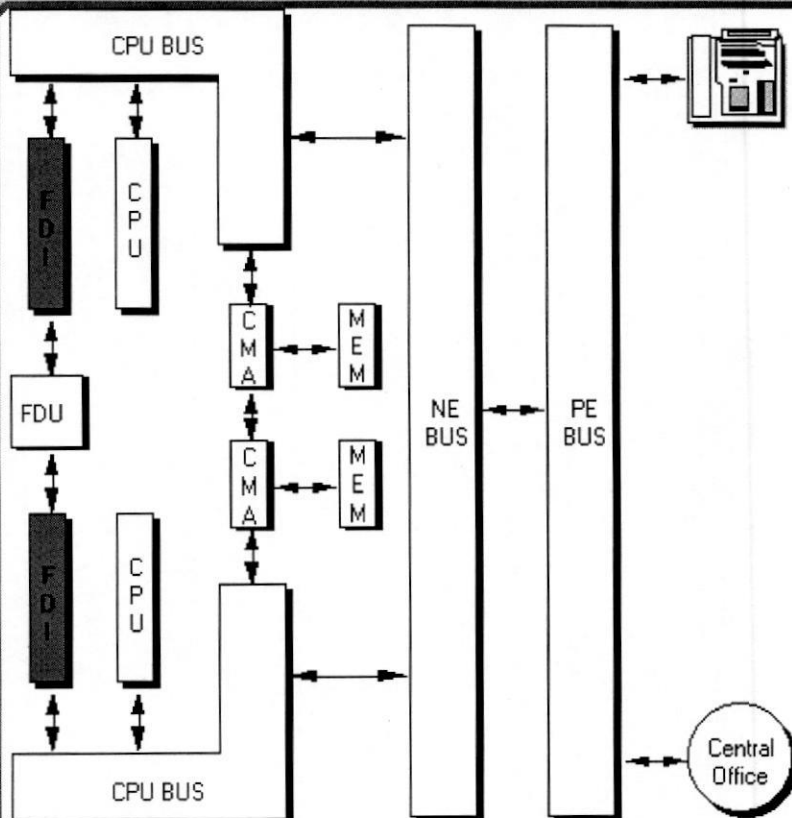
It provides address matching, disk drive control, data buffering and interrupt control circuits.



Floppy Disk Interface:

The FDI card in a dual CPU system provides all of the same operations as it does in a single CPU system.

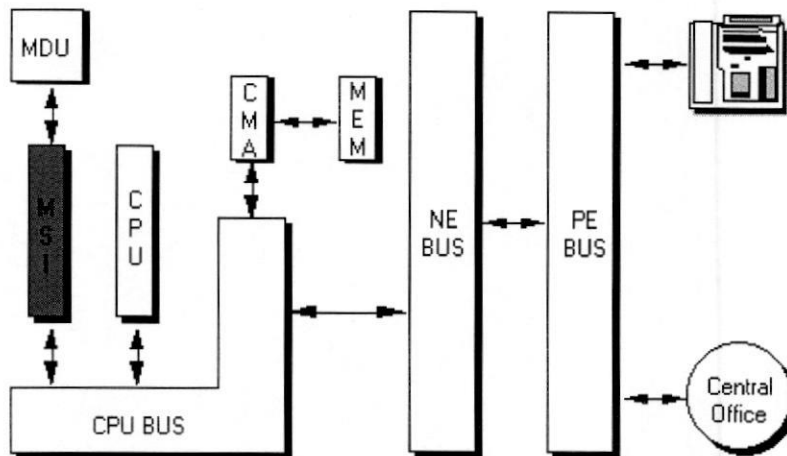
A schematic showing card interactions in a dual CPU system is shown here.



Mass Storage Interface:

This card interfaces the Multi Disk Unit and the CPU. It provides address matching, disk drive control, data buffering and interrupt control circuits.

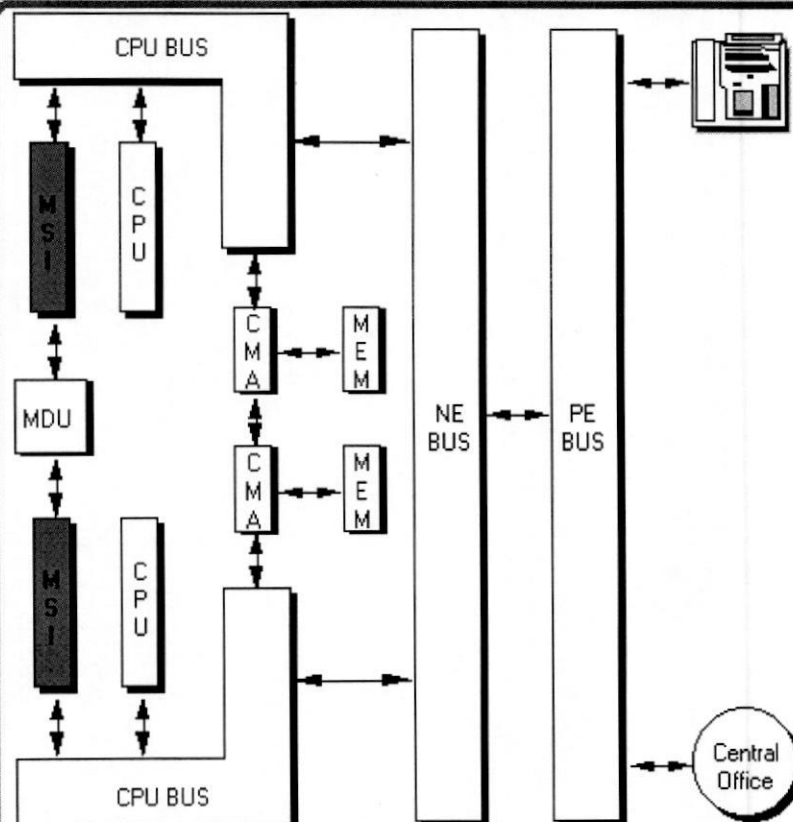
This schematic shows a single CPU system such as an Option 51.

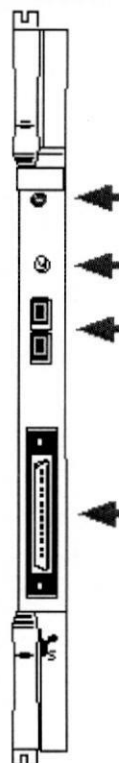


Mass Storage Interface:

The MSI card in dual CPU systems, such as the Options 61 and 71, provides all of the same operations.

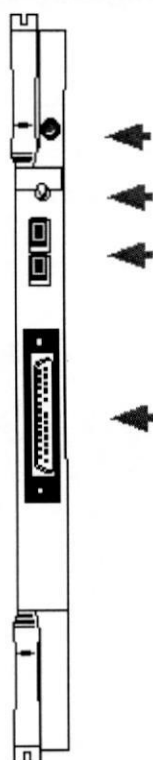
A schematic showing card interactions in a dual CPU system is shown here.





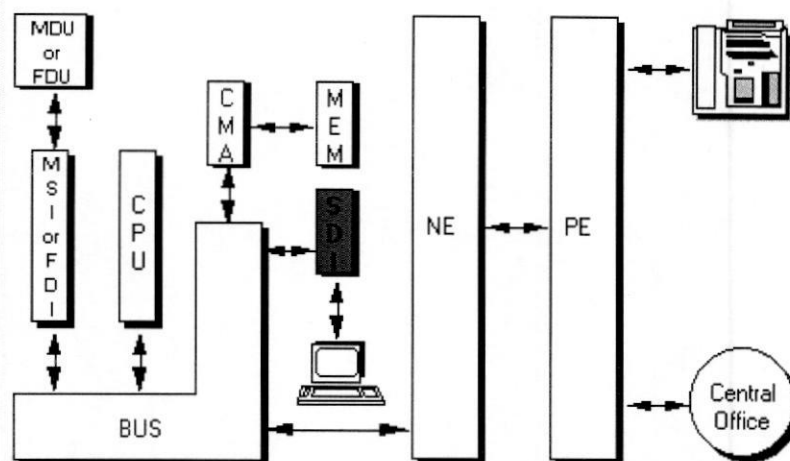
Faceplate features of the MSI are:

- Red LED: When lit, this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Two Digit Maintenance display: Indicates the status of the Multi Disk Unit.
- One Cable Jack: Used to connect the MSI with the Multi Disk Unit.



Faceplate features of the MSI are:

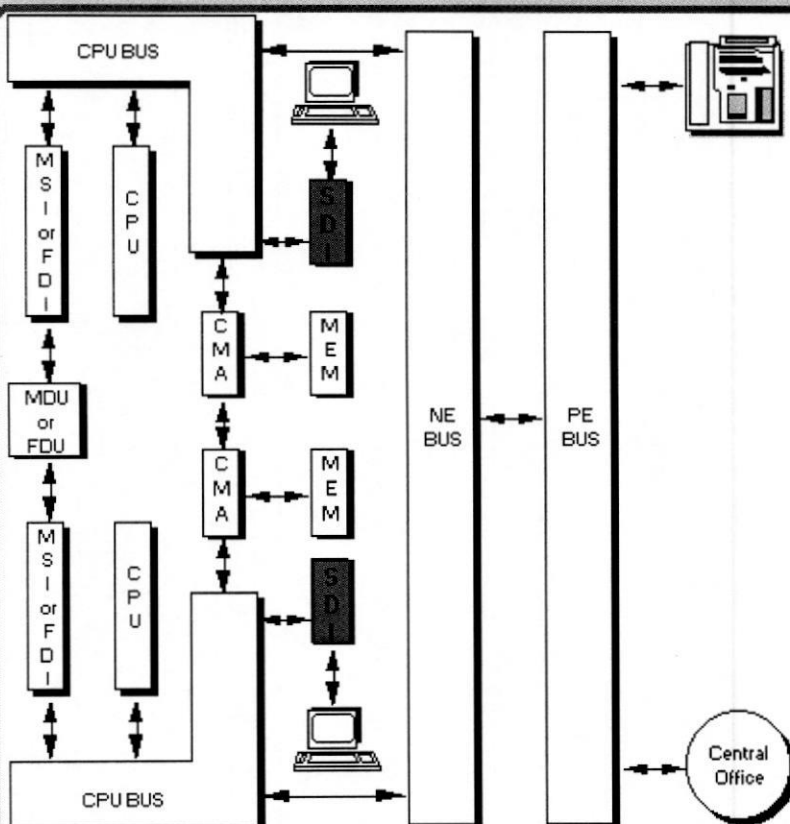
- Red LED: When lit, this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the pack.
- Two Digit Maintenance display: Indicates the status of the Multi Disk Unit.
- One Cable Jack: Used to connect the MSI with the Multi Disk Unit.



Four Port Serial Data Interface:

This card provides serial ports between the system processor and an external device. Each port supports:

- RS-232-C interface
- 8 bit ASCII data with parity and stop bit
- asynchronous, start-stop operation
- data rates of 300, 600, 1200, 2400, 4800 and 9600 baud
- DTE and DCE mode



Four Port Serial Data Interface

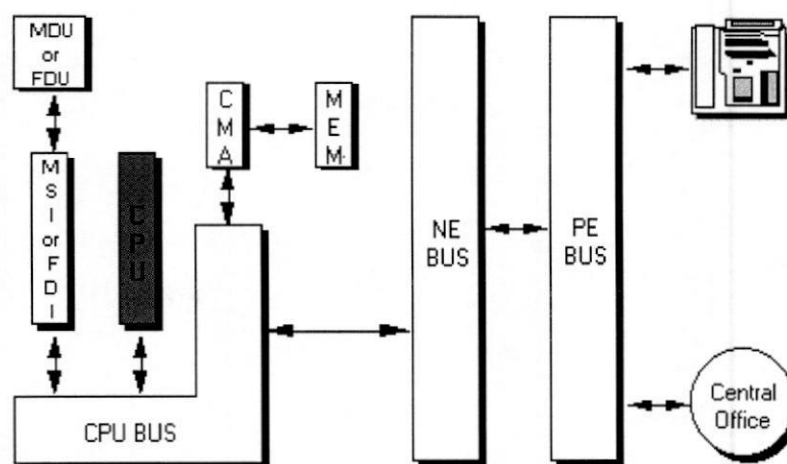
The SDI card in a dual CPU system provides all of the same operations as in a single CPU system. The number of SDIs required is based on individual customer configuration.

A schematic showing card interactions in a dual CPU system is shown here.



Faceplate features of the SDI are: ✕

- Red LED: When lit this LED indicates the card is inactive or faulty.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Two Cable Jacks: Used to connect the SDI to the I/O panel.

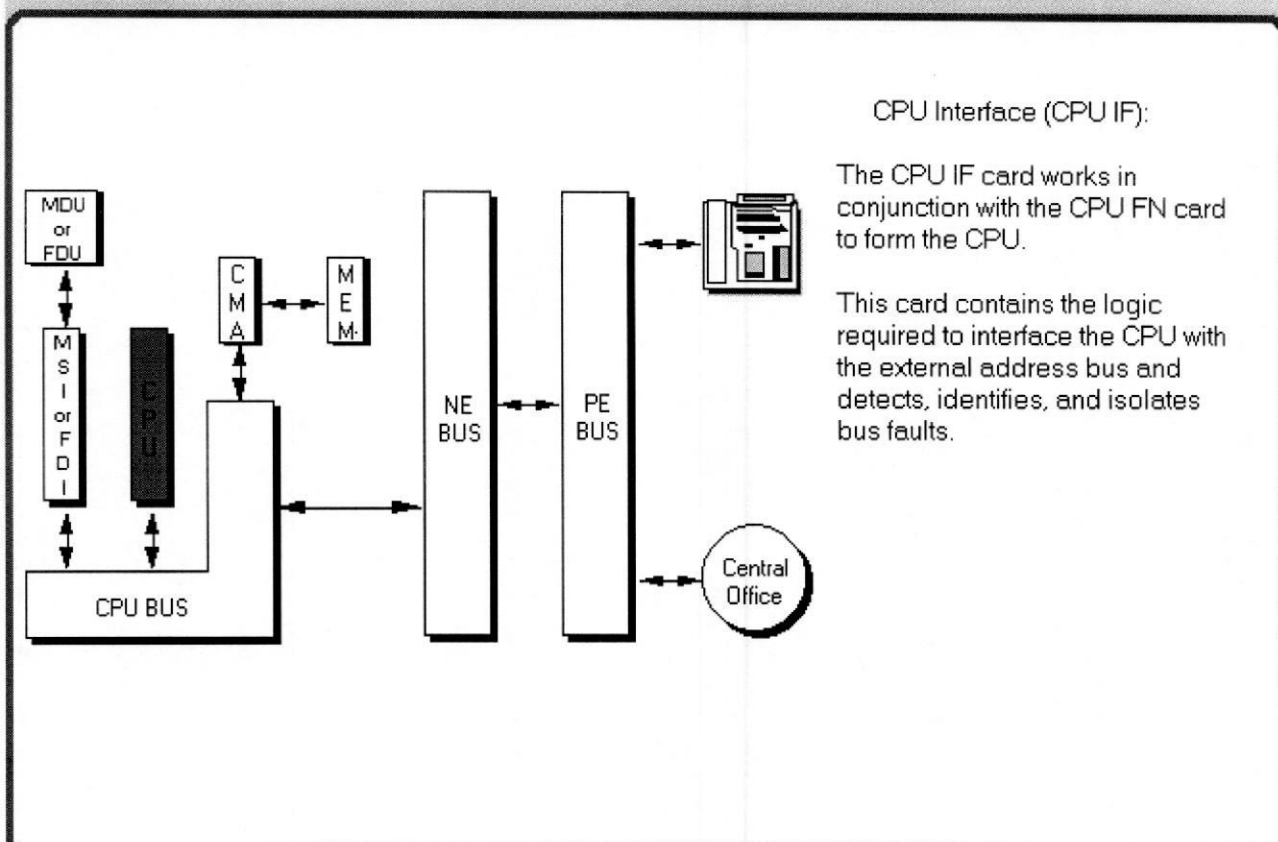
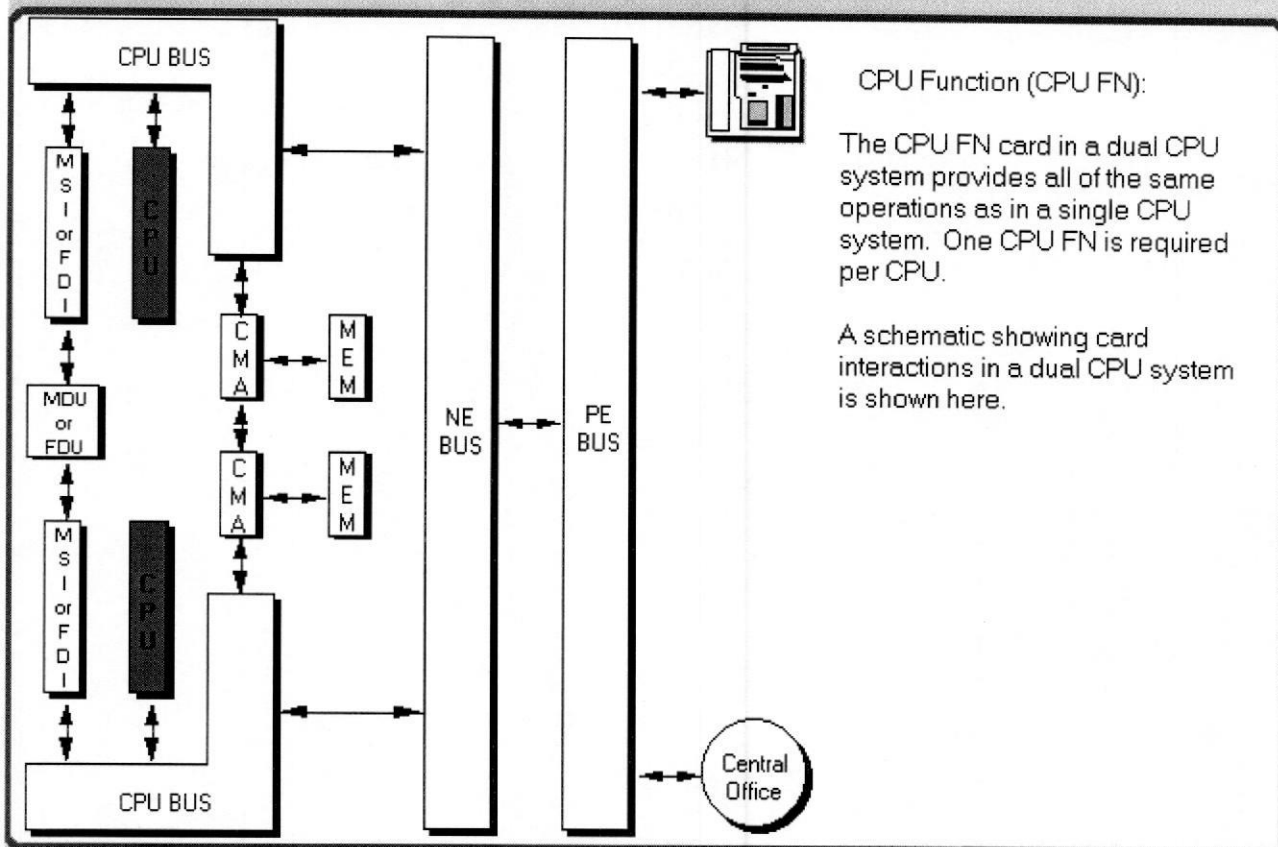


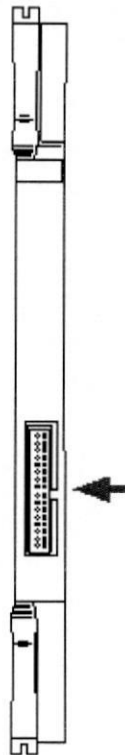
CPU Function (CPU FN): ✓

The CPU FN card in conjunction with the CPU IF card, form the CPU.

The CPU contains the main circuitry for the CPU providing arithmetic/logical functions, instruction decoding and system code timing. A ROM daughter board mounts on this card.

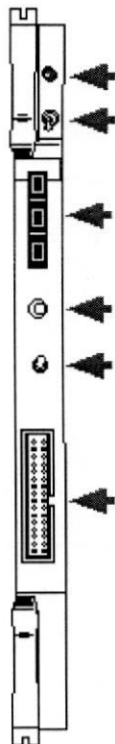
This schematic is of a single CPU system. ✓





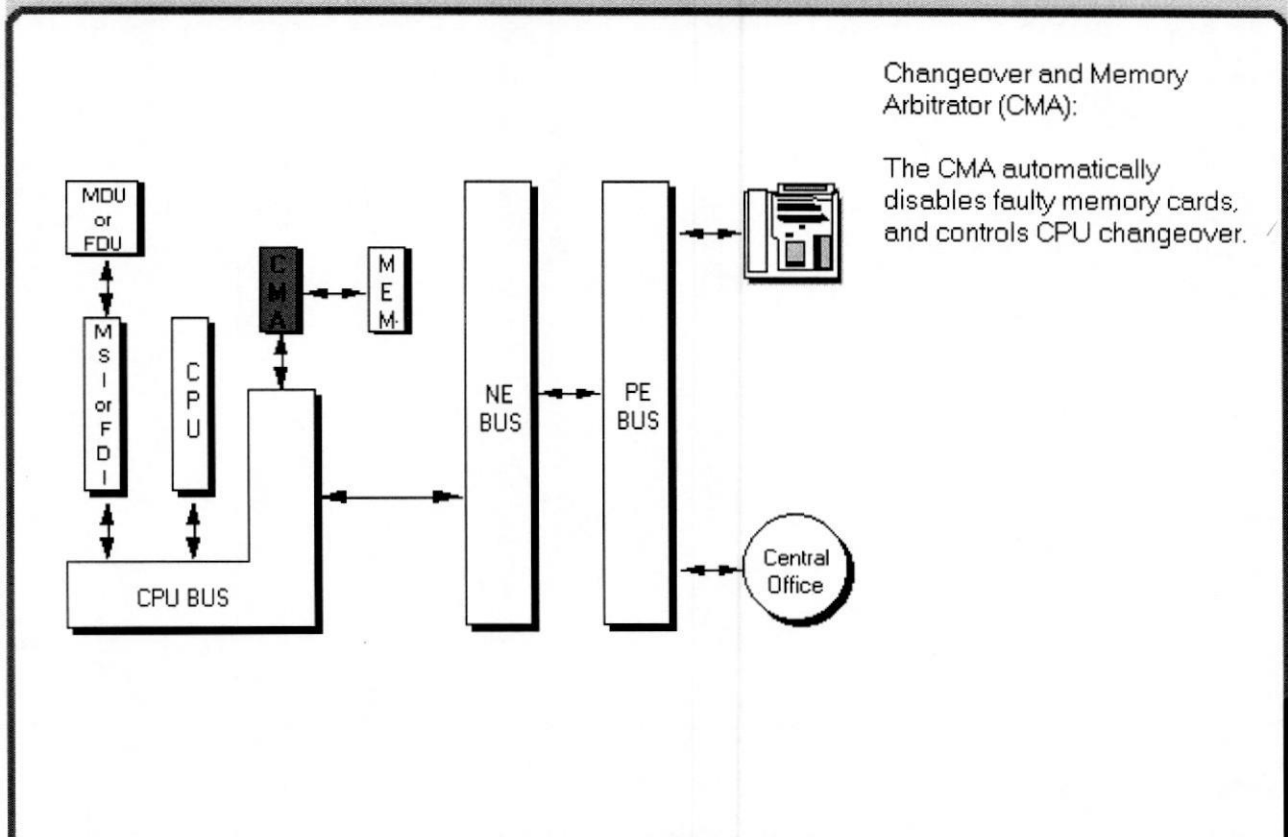
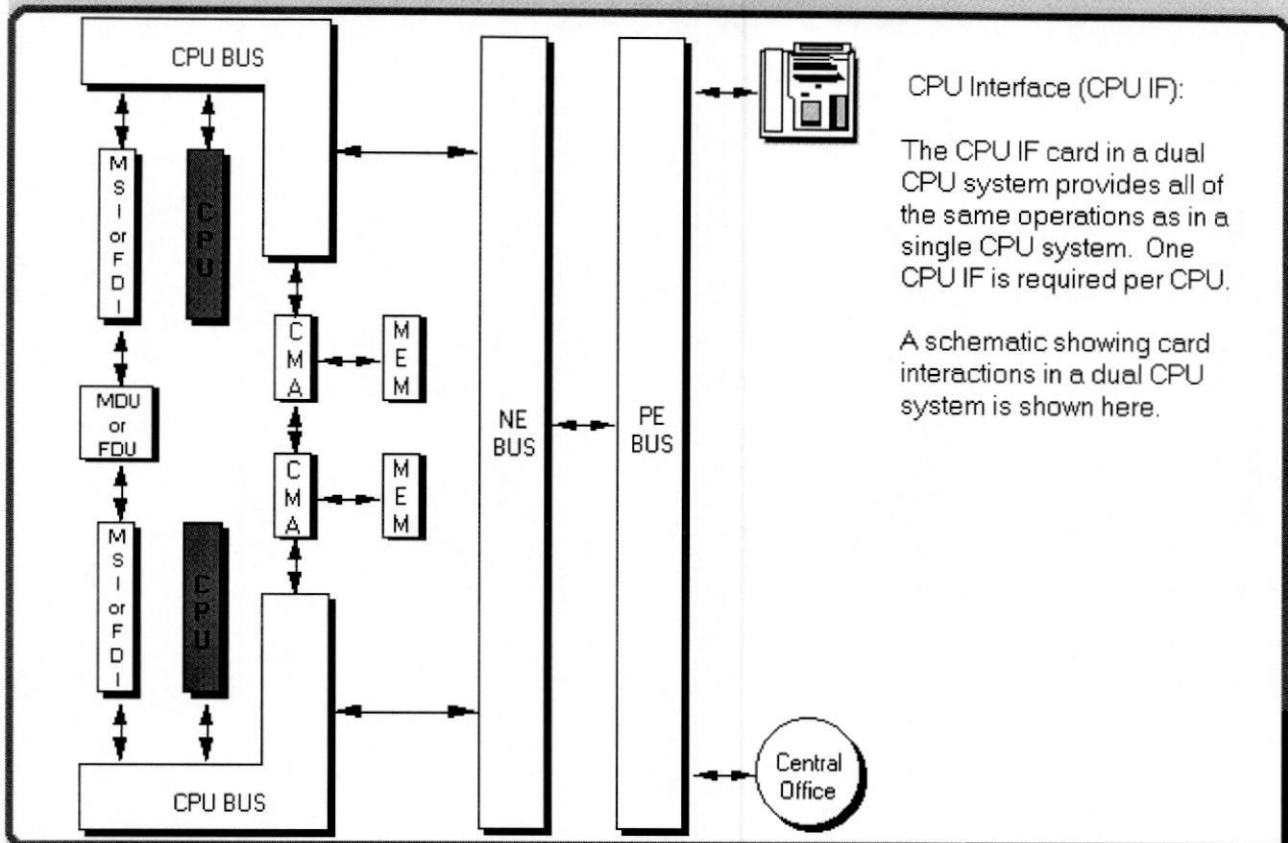
Faceplate features of the CPU FN card are:

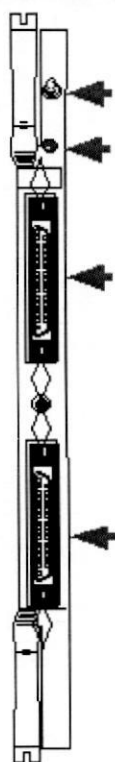
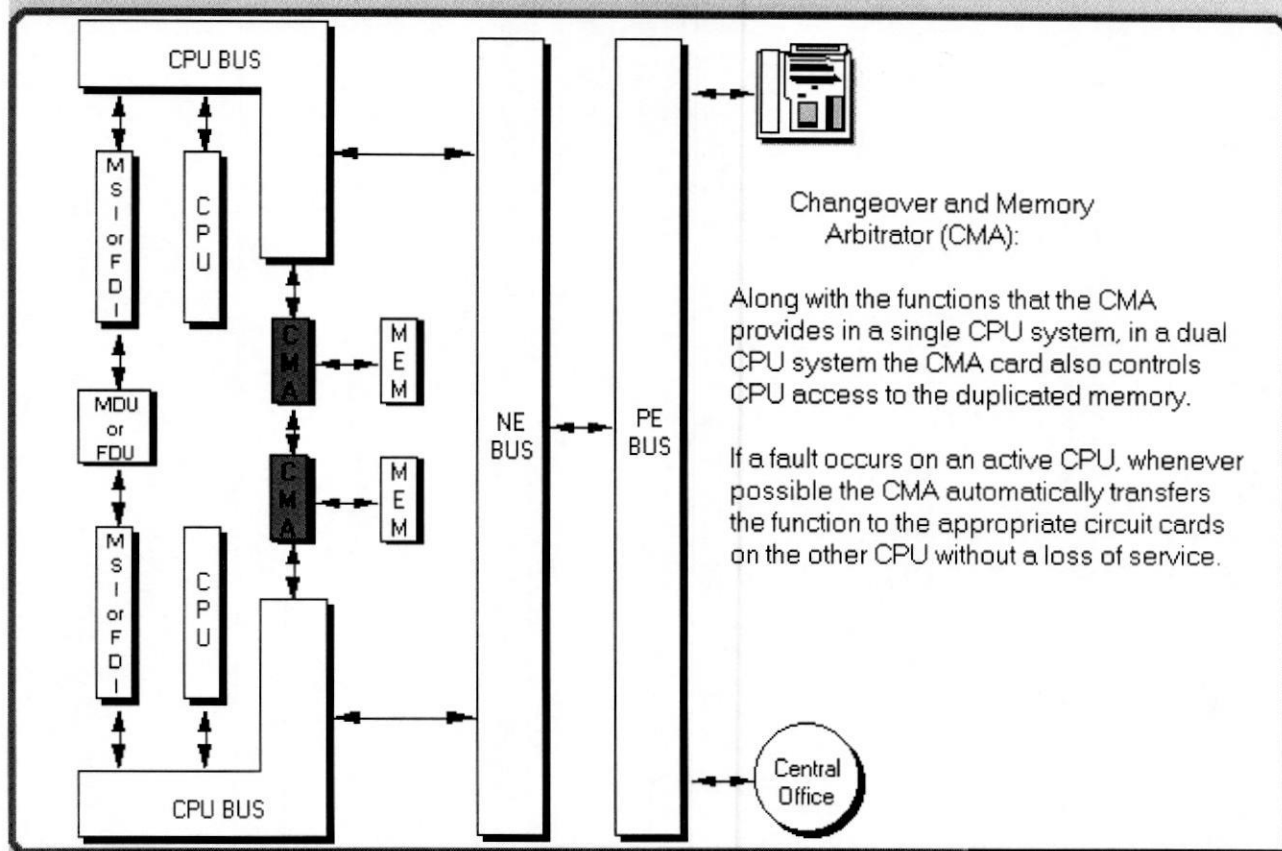
- One Cable Jack: Connects this card to the CPU IF card.



Faceplate features of the CPU IF are:

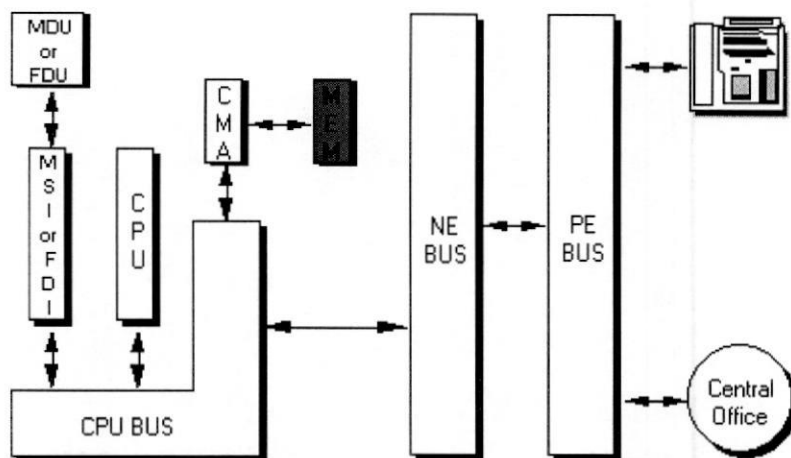
- Red LED: When lit, this LED indicates that the CPU is in Standby mode.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Three Digit Maintenance display: Indicates the Common Equipment faults.
- INI Button: Used to manually invoke the Initialize (INI) Routine.
- NORM/MAINT Switch: Used to prevent a CPU swap.
- One Cable Jack: Connects to the CPU FN card.





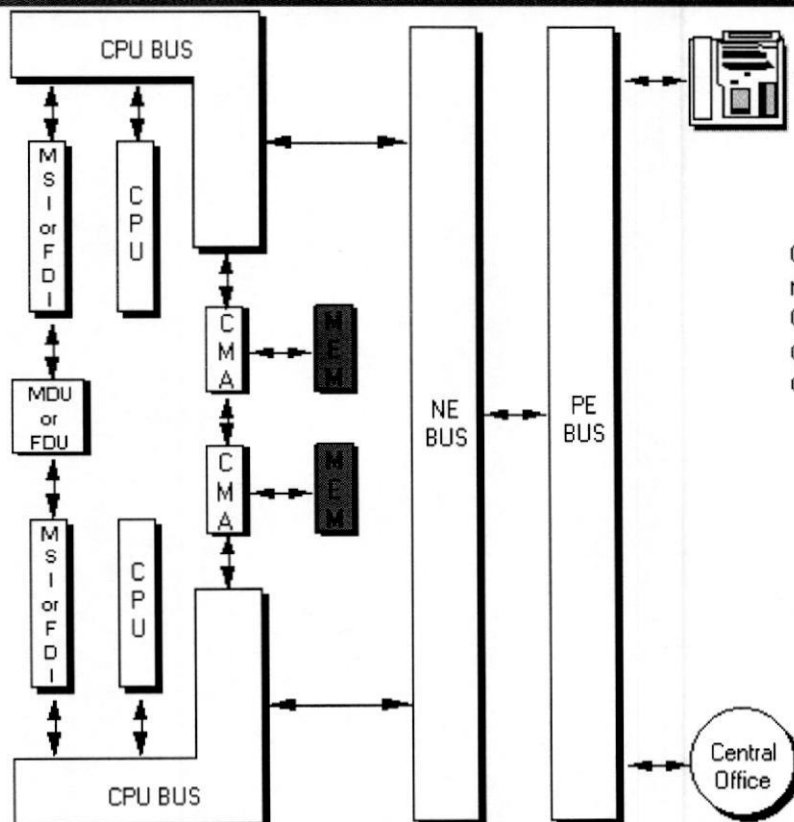
Faceplate features of the CMA are:

- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Red LED: When lit, this LED indicates the card is inactive or faulty.
- Two Cable Jacks: Used to connect the DMAs in dual CPU systems. Not used in single CPU systems.



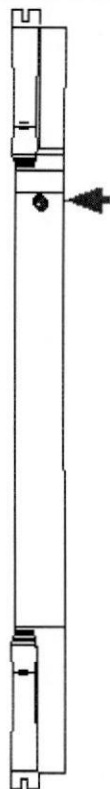
Memory (MEM):

With the X11 software release 18, a new 6Mbyte memory card increases memory capacity for the Options 51, 61 and 71.



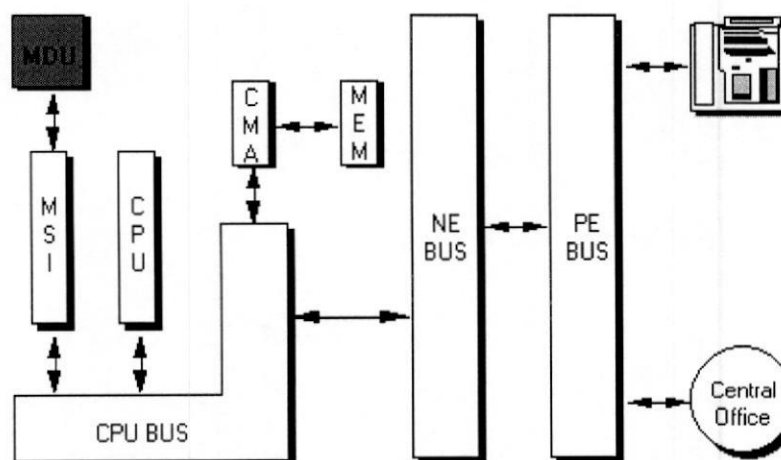
Memory (MEM):

Old 768K and new 6 MByte memory cards cannot be mixed. Only 2 cards of the same capacity can be configured in dual CPU systems.



Faceplate features of the MEM card are:

- Red LED: When lit, this LED indicates the card is inactive or faulty.

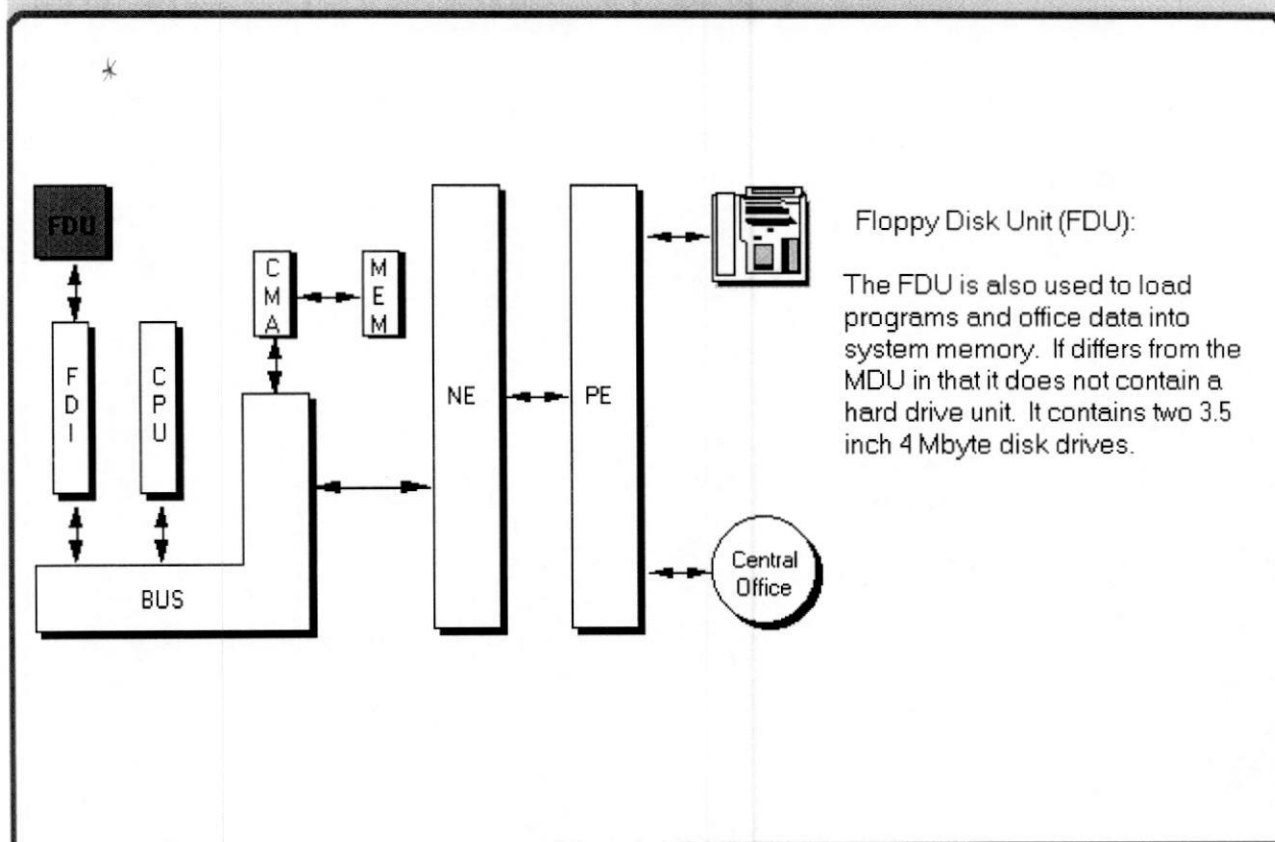
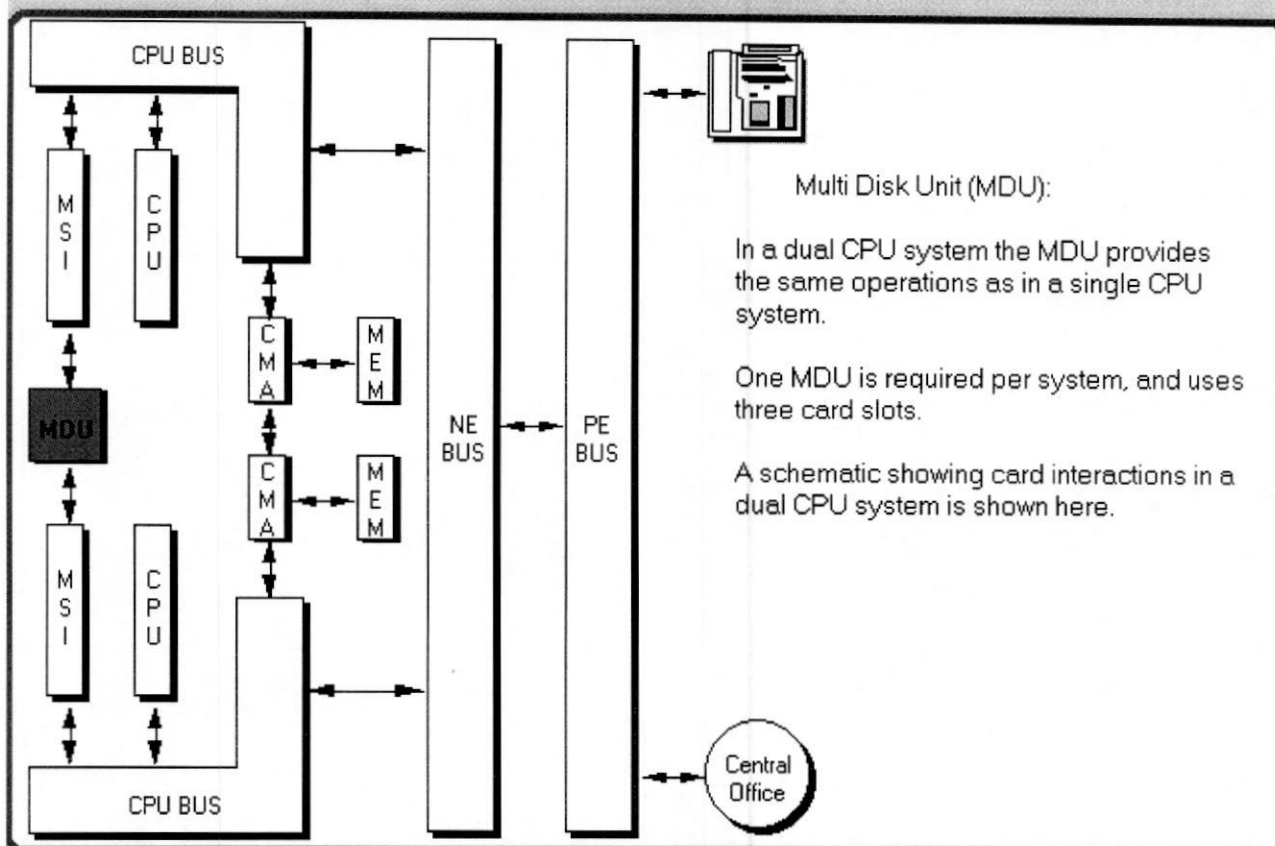


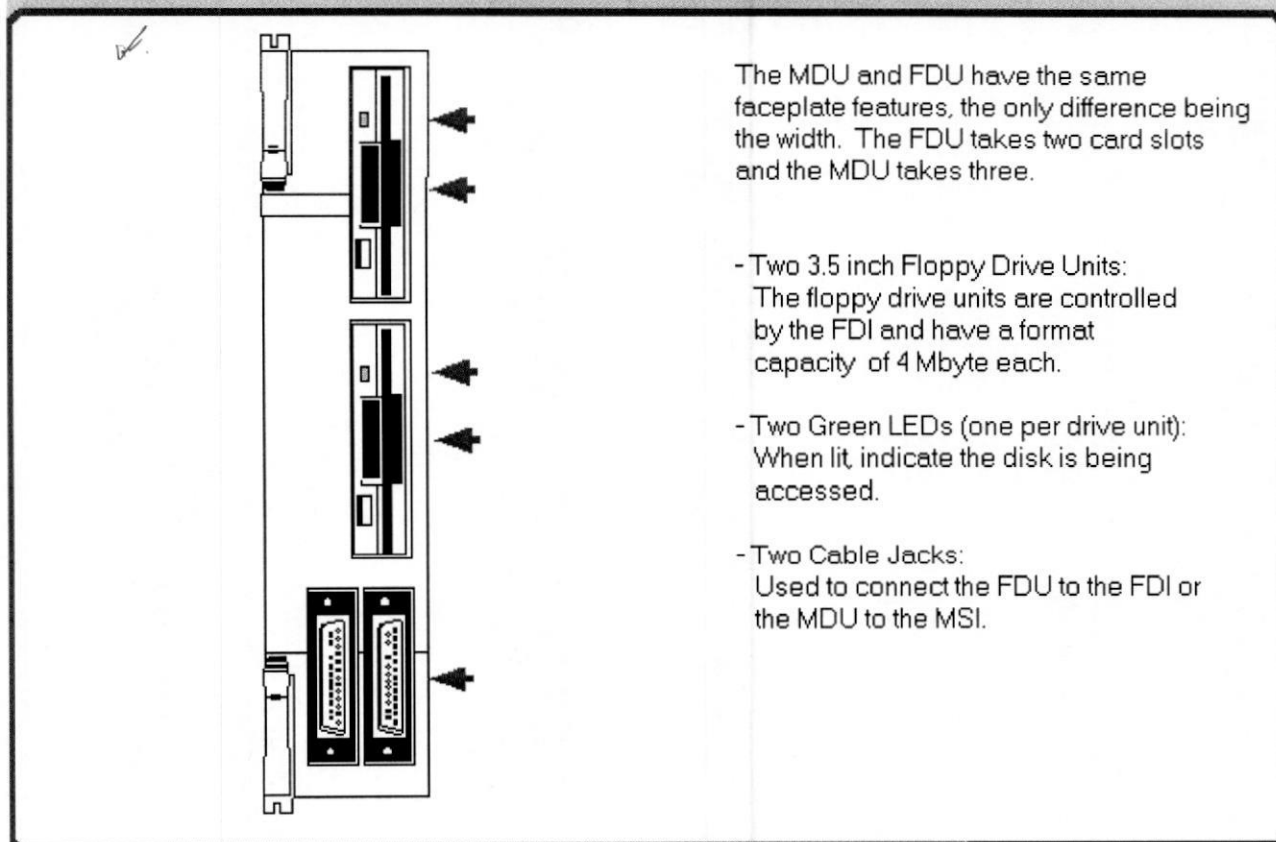
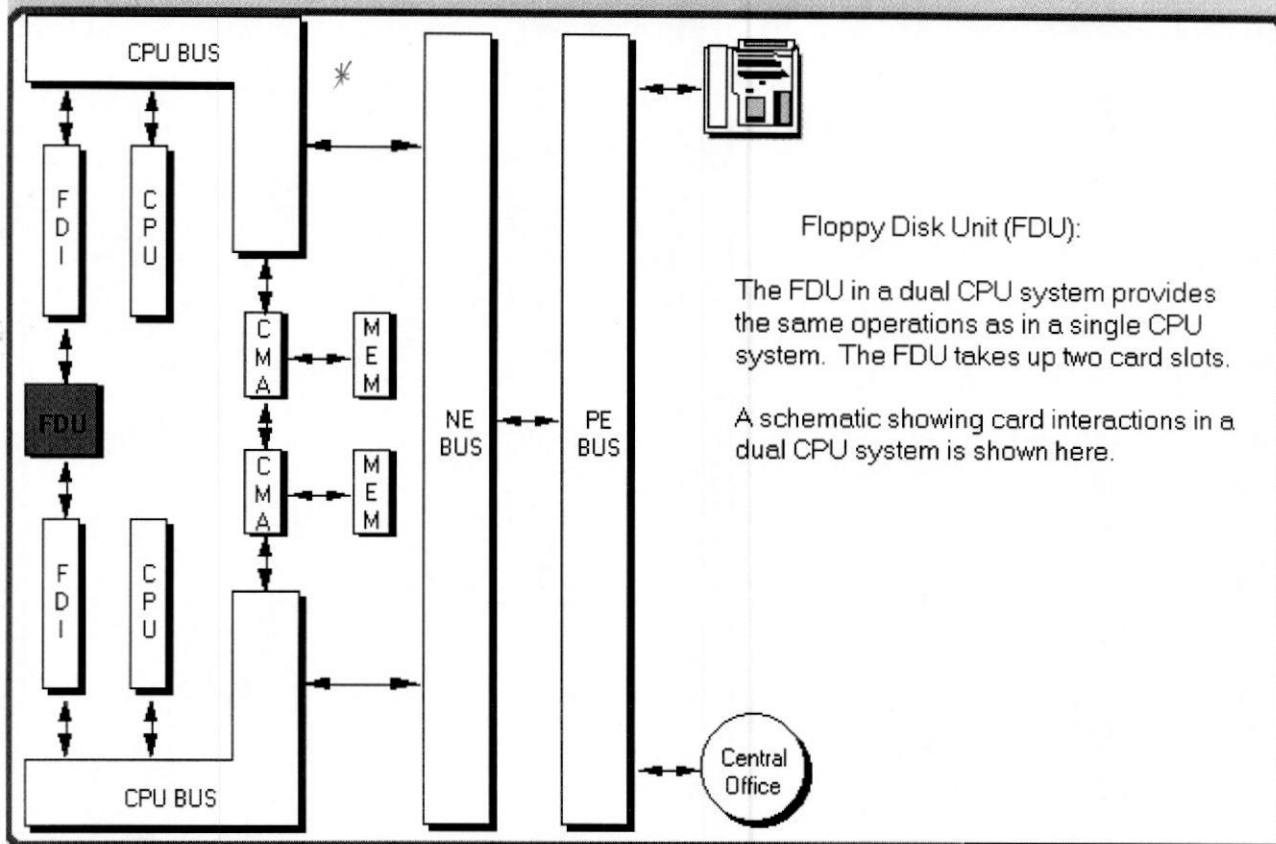
Multi Disk Unit (MDU):

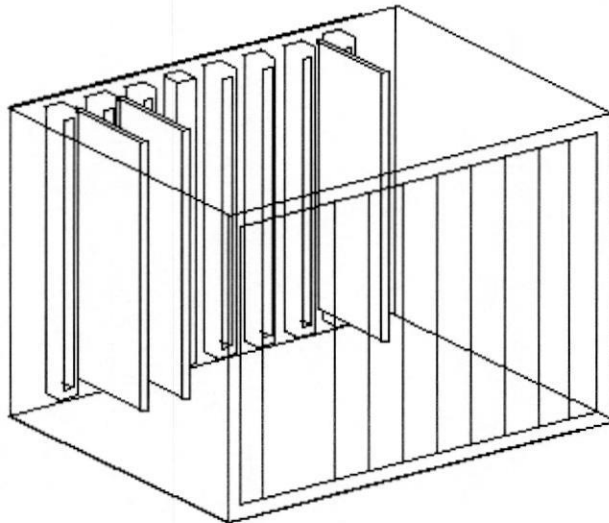
With the introduction of the X11 software release 18, the storage media for software required expansion.

The MDU is used to load programs and office data into system memory.

The MDU contains two 4 Mbyte floppy disk drives and a 120 Mbyte hard disk.







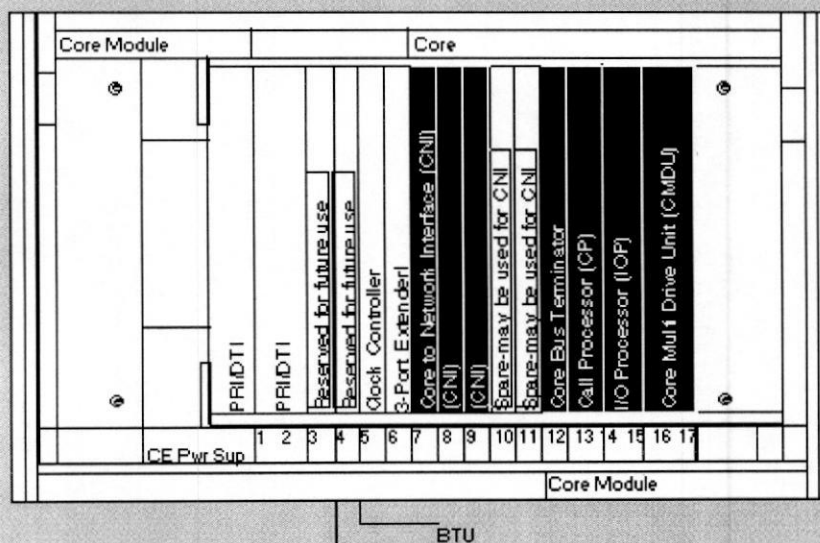
Bus Termination Units (BTUs):

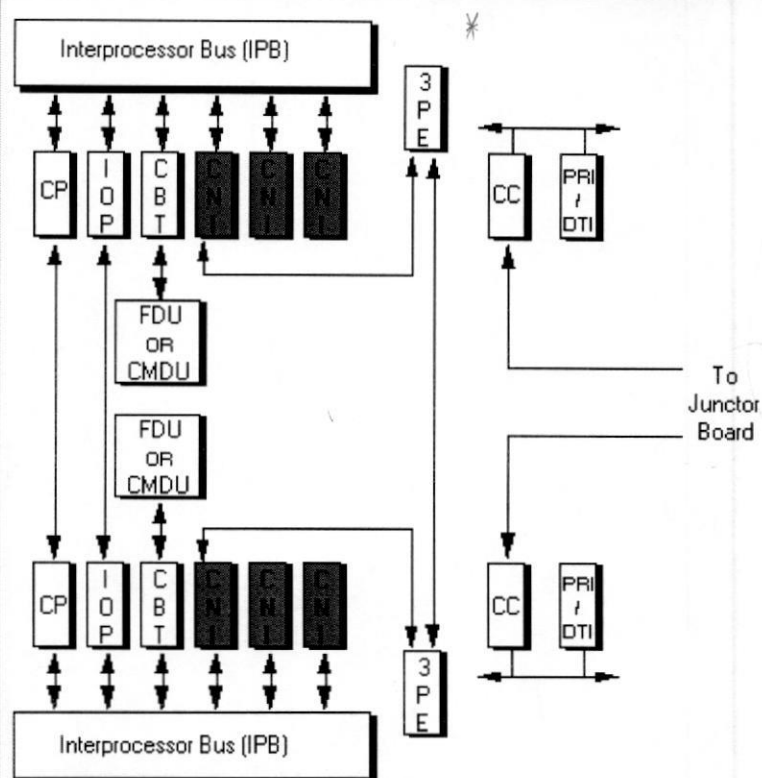
BTUs are paddle boards located between circuit cards and are required to correctly terminate CE and NE buses.

In the CNE Module, BTUs are placed between card slots 1 and 2, 2 and 3 and 12 and 13.

Core Module

The Common Equipment section for this module houses the common control complete, CPU memory and mass storage functions. This common equipment module is used only in the Option 81. Two Core modules are required, providing redundant common control operation.

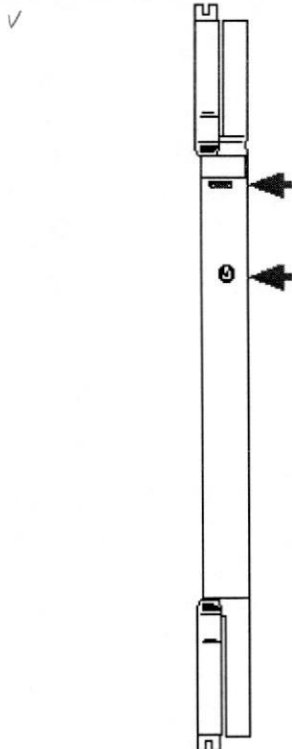




Core to Network Interface (CNI):

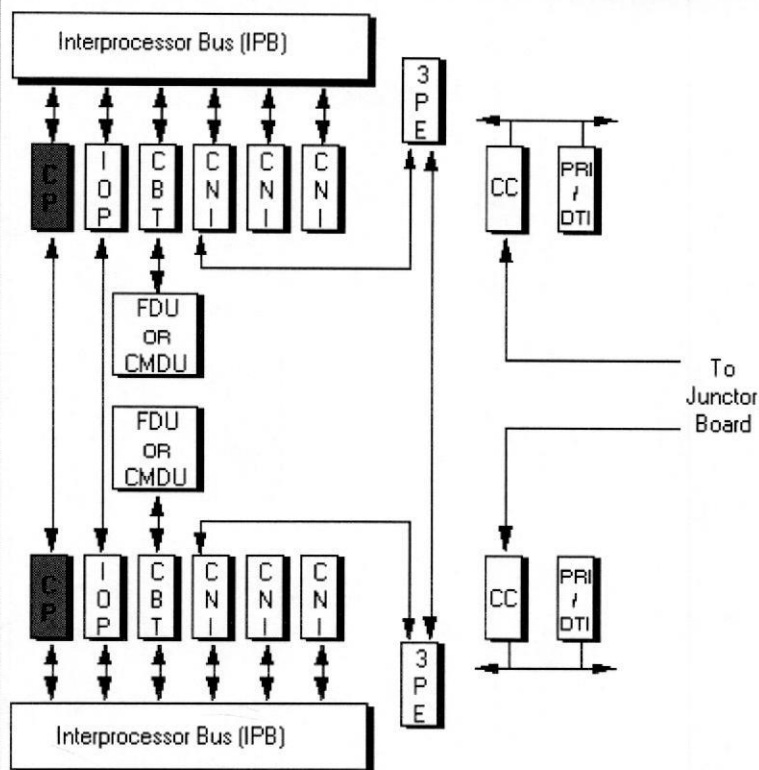
This card provides the interface between the inter-processor bus and the network shelves, and between the Call Processor card and 3PE cards in the Network shelf.

Each port on the CNI card provides functions similar to one SBE card in the Option 71.



Faceplate features of the CNI are:

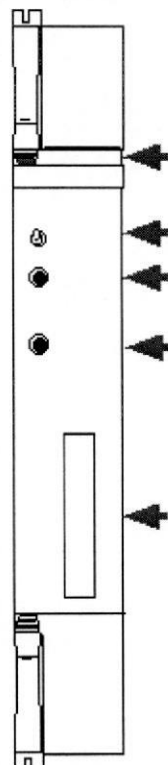
- Red LED: When lit, indicates that the designated port is disabled.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.



Call Processor (CP):

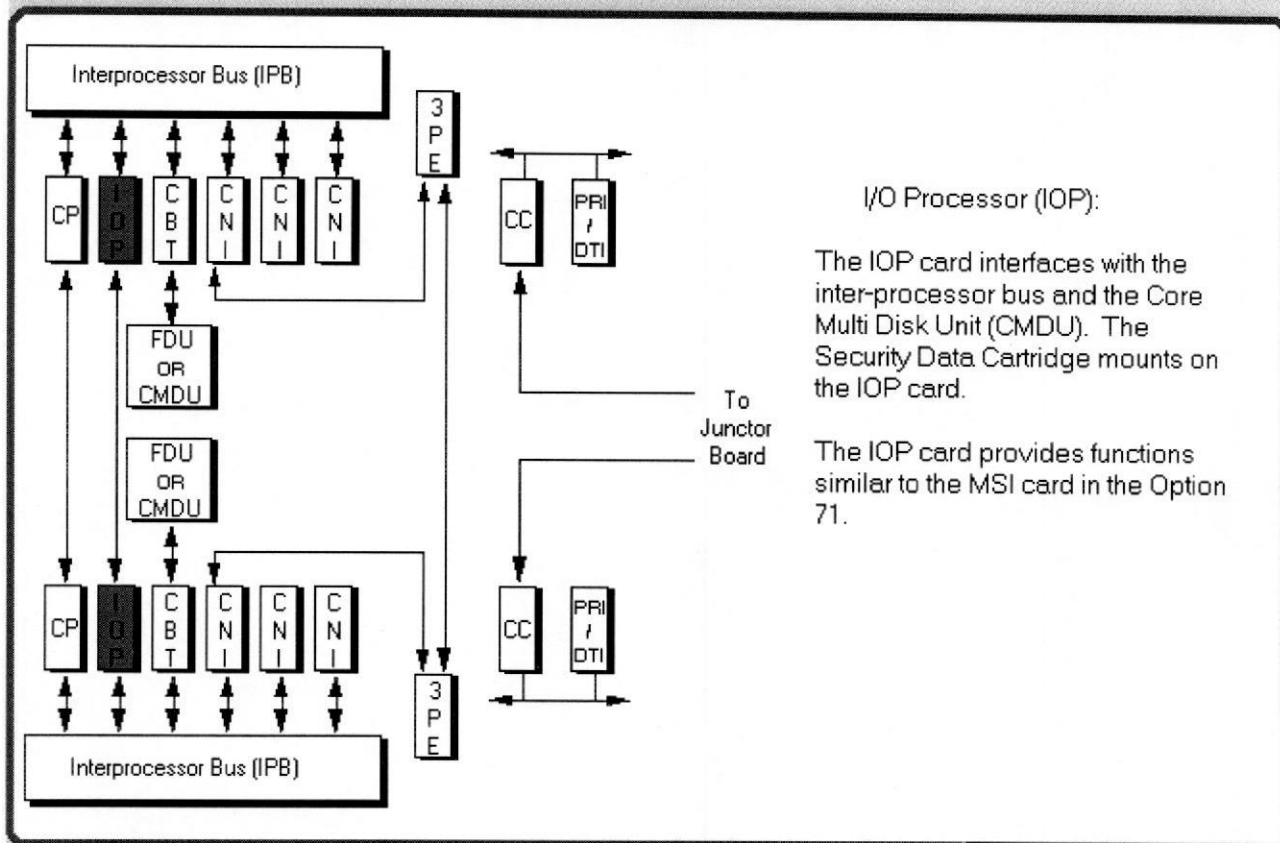
The CP card executes all call processing software, interfaces with the inter-processor bus, and provides on-board main memory and cache memory, system time of day clock/ calendar and a pair of serial data ports for maintenance.

The CP card in the Option 81 provides similar functions to the CPU FN, CPU IF, CMA, Memory and ROM cards in Option 71.



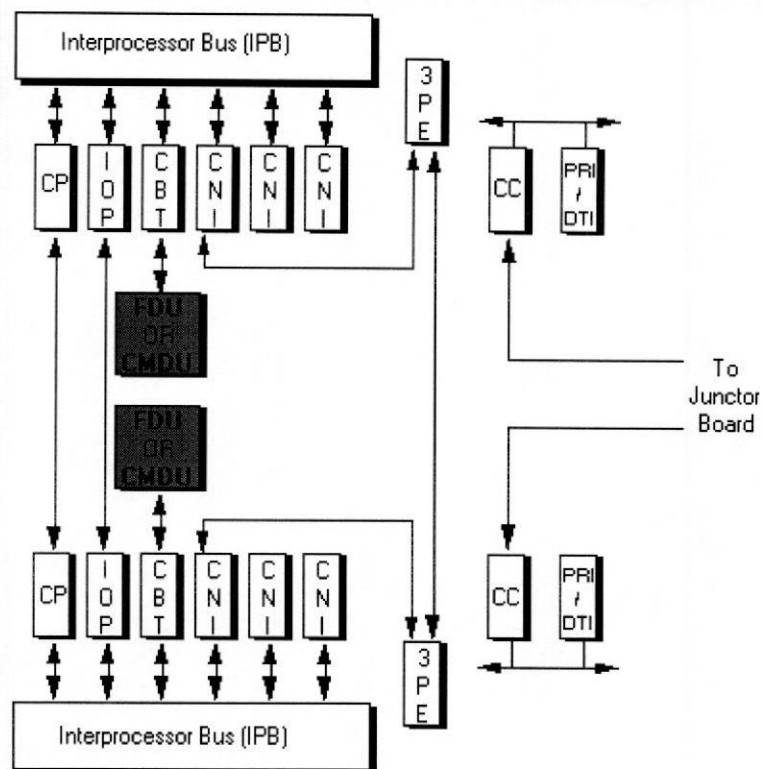
The faceplate features of the Call Processor card are:

- Red LED- When lit, indicates the port is disabled, faulty or unequipped.
- NORM/MAINT Switch - Used to prevent a CPU swap.
- Man INT Button - Used to manually invoke the Initialize (INI) Routine.
- Man RST - Used to manually invoke a complete reload of the system.
- 2 line LCD display - Displays fault messages.



The faceplate features of the IOP card are:

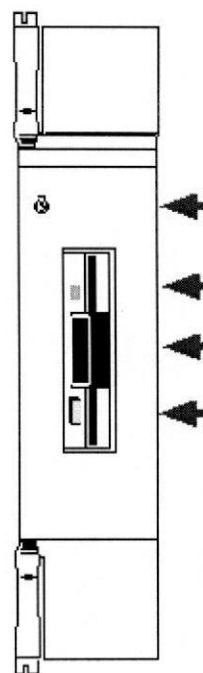
- Red LED - When lit, indicates the port is faulty, unequipped or disabled.
- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Maintenance Display: Indicates whether the processor is busy or idle.



Core Multi Drive Unit (CMDU)

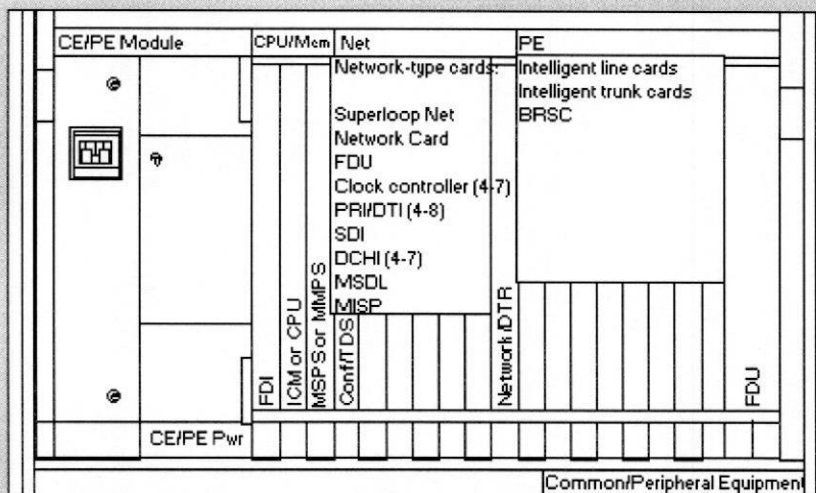
This card is used to load the programs and office data into the system memory. It contains one 3.5 inch super high density floppy drive with a formatted capacity of 2.88 Mbytes, and a 3.5 inch hard disk drive with a capacity of 120 Mbytes.

The CMDU provides functions similar to the MDU in the Option 71.



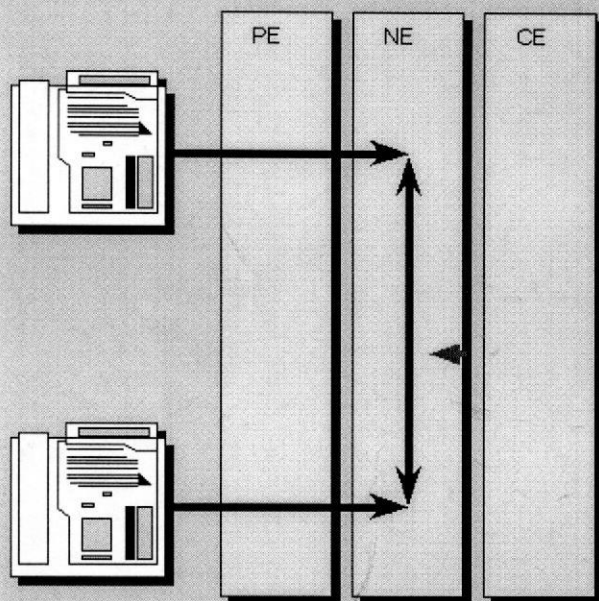
The faceplate features of the CMDU are:

- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- One 3.5 inch floppy drive unit: Provides a formatted capacity of 2.88 Mbytes.
- Green LED: When lit, indicates the floppy drive is being accessed.
- Yellow LED - When lit, indicates the hard drive is being accessed.



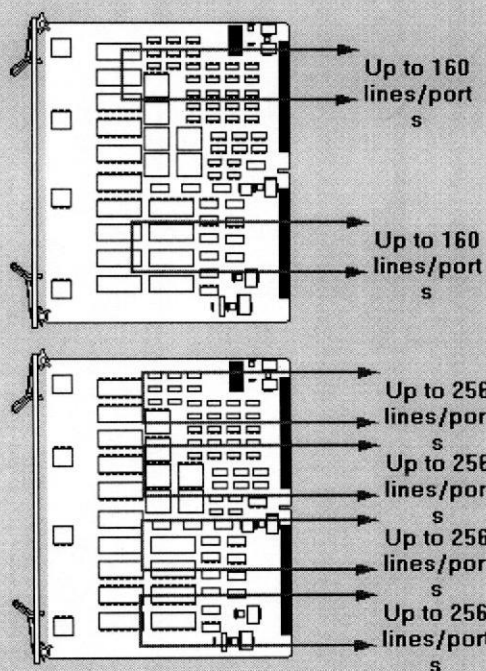
This is the last page of lesson two. Use the up one level button to return to the lesson menu. If you would like to review information in this lesson, use the back arrow below.

If you would like more detailed information about Meridian 1 Common Equipment, consult the System planning and engineering guide, Equipment identification, Section 553-3001-154.



El equipo de red ejecuta la conmutación actual de información entre conexiones de teléfonos y de datos.

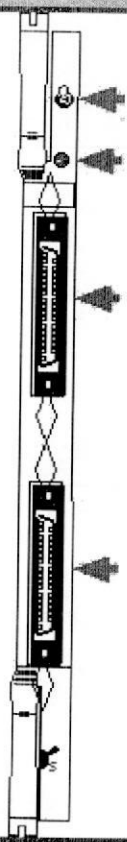
La conmutación es ejecutada bajo el control del CPU.



Las tarjetas de red pueden usar 2 ó 4 loops para formar una ruta de comunicación.

Hay 2 tipos de tarjetas las cuales proveen loops. Una tarjeta ENET (Enhanced Network) la cual provee 2 loops. Una tarjeta SNET (Superloop Network) la cual provee 4 loops.

Un loop soporta hasta 160 líneas/puertos por shelf. Un Superloop soporta hasta 512 líneas/puertos por shelf.



Faceplate features of the 3PE are:

- ENB/DIS Switch: Used to manually hardware enable or disable the card.
- Red LED: When lit, this LED indicates the card is inactive or faulty.
- Two Cable Jacks: Used to connect the 3PE to SBE card in the CE.